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**CONTINGENCY CONTRACTING IN
SUPPORT OF CONUS DISASTERS: A CASE
STUDY OF THE 1994 NORTHRIDGE
EARTHQUAKE, 2005 HURRICANE
KATRINA AND 2012 HURRICANE SANDY**

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June 2014

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HURRICANE KATRINA AND 2012 HURRICANE SANDY**

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LIST OF ACRONYMS AND ABBREVIATIONS

ACI	Advanced Contracting Initiative
ACC	Army Contracting Command
APHIS	Animal and Plant Health Inspection Service
CA	California
Caltrans	California Department of Transportation
cASM	Contingency Acquisition Support Model
CCDR	Contractor Cost Data Report
CCO	Contingency Contracting Officer
CHP	California Highway Patrol
CIWMB	California Integrated Waste Management Board
CIKR	Critical Infrastructure and Key Resources
CIMS	Citywide Incident Management System
CONUS	Continental United States
CORE	Cadre-On-Response Employees
CRS	Congressional Research Service
CSP	Coastal Storm Plan
D&F	Determinations and Findings
DAEs	Disaster Assistance Employees
DASD(PS)	Deputy Assistant Secretary of Defense for Program Support
DAU	Defense Acquisition University
DC	District of Columbia
DHS	Department of Homeland Security
DLA	Defense Logistics Agency
DMAT	Disaster Medical Assistance Teams
DOD	Department of Defense
DOE	Department of Energy
DOI	U.S. Department of Interior
DOT	U.S. Department of Transportation
DPAP	Defense Procurement and Acquisition Policy
DTEs	Disaster Temporary Employees

ECC	Expeditionary Contracting Command
EMAC	Emergency Management Assistance Compact
EMI	Emergency Management Institute
EOC	Emergency Operations Center
FAI	Federal Acquisition Institute
FDNY	Fire Department of New York City
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FLETC	Federal Law Enforcement Training Center
FNS	Food and Nutrition Service
GAO	Government Accounting Office
GM	General Motors
GO	General Officer
GSA	General Services Administration
H&HS	Health and Human Services
HOV	High Occupancy Vehicle
HSPD-5	Homeland Security Presidential Directive 5
HUD	Department of Housing and Urban Development
ICS	Incident Command System
IDIQ	Indefinite Delivery Indefinite Quantity
IG	Inspector General
IP	Internet Protocol
J&A	Justification and Authorizations
JCCS	Joint Contingency Contracting System
LA	Los Angeles
LA	Louisiana
LADOT	City of Los Angeles Department of Transportation
LAWAP	Los Angeles Department of Water and Power
LIPA	Long Island Power Authority
MATOC	Multiple Award Task Order Contracts
MBA	Masters of Business
MCI	Marine Corps Institute

MICC	Mission and Installation Contracting Command
MEU	Marine Expeditionary Unit
MSC	Major Subordinate Commands
MTA	Metropolitan Transit Authority
NDMS	National Disaster Medical System
NEMA	National Emergency Management Association
NFA	National Fire Academy
NGB	National Guard Bureau
NIPERNet	Non-classified Internet Protocol Router Network
NIPP	National Infrastructure Protection Plan
NJ	New Jersey
NPG	National Preparedness Guidelines
NOAA	National Oceanic and Atmospheric Administration
NORTHCOM	United States Northern Command
NRF	National Response Framework
NYC	New York City
NYCHA	New York City Housing Authority
NYPD	New York City Police Department
OJT	On-the-Job-Training
OMB	Office of Management and Budget
OSD	Office of Secretary of Defense
PA	Pennsylvania
SAFE Port Act	Security Accountability for Every Port Act
SATOC	Single Award Task Order Contracts
SBA	Small Business Administration
SCRRA	Southern California Regional Rail Authority
SPOT -ES	synchronized pre-deployment tracker—Enterprise Suite
SSPs	Sector Specific Plans
TMP	Traffic Management Plan
TX	Texas
U.S.	United States
USACE	U.S. Army Corps of Engineers

USAR	Urban Search and Rescue
USCG	United States Coast Guard
USDA	U.S. Department of Agriculture
USDOT	United States Department of Transportation
VEILS	Virtual experience immersive learning simulation

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I. INTRODUCTION

A. BACKGROUND

The first uses of contingency contracting by the United States dates back to the American Revolution. During times of extremis, and when demand and requirements have overwhelmed existing resources, the United States government has frequently looked to commercial sources to contract for goods and services. During the Revolution, things such as food, transportation, and weapons were routinely contracted for from commercial sources (Defense Procurement and Acquisition Policy [DPAP] website).

American conflicts and the estimated number of contractors supporting the wars are shown in Table 1. Since the Revolution, there have been varying degrees of reliance on contractors for wartimes support; however, the Iraq and Afghanistan wars show an incredibly high ratio of support; a near 1:1 contractor to military personnel average during the time period from which this data was derived (DPAP website).

War/Conflict	Contracted Personnel	Military	Ratio
Revolution	1,500 (Est)	9,000	1:6 (Est)
Mexican/American	6,000 (Est)	33,000	1:6 (Est)
Civil War	200,000 (Est)	1,000,000	1:5 (Est)
World War I	85,000	2,000,000	1:20
World War II	734,000	5,400,000	1:7
Korea	156,000	393,000	1:2.5
Vietnam	70,000	359,000	1:6
Persian Gulf War	5,200	541,000	1:100
Rwanda/Somalia/Haiti	No Records Kept	N/A	N/A
Balkans	5,000–20,000	(Varied) 20,000	Up to 1.5:1
Iraq	95,461	95,900	1:1
Afghanistan	112,092	79,100	1.42:1

Table 1. Wartime Use of Contractors During American Conflicts
(from DPAP Contingency Contracting website)

The first use of contingency contracting during CONUS disaster relief efforts is more difficult to determine. Probably the first disaster relief type legislation passed in the United States was the Congressional Act of 1803, which provided assistance to a New Hampshire town following a very destructive fire. For almost 100 years following the 1803 Act, ad hoc legislation was passed more than 100 times in response to hurricanes, earthquakes, floods, and other natural disasters. Detailed information on contingency contracting during CONUS disasters and emergencies during the 18th and 19th centuries is largely unrecorded. However, due to the magnitude of some events (such as the Johnstown, Pennsylvania, flood of 1889; the Galveston, Texas, hurricane of 1900; and the San Francisco, California, earthquake of 1906), it is reasonable to assume that the relief efforts included contracting for services such as debris removal, temporary shelters, and medical support. Although contingency contracting policies and regulations at the state and federal levels were probably near non-existent at the time, contracting actions almost certainly occurred due to the need to act quickly to save lives and property.

B. PURPOSE AND OBJECTIVES

The purpose of this thesis is to review several CONUS disasters during the last twenty years and analyze the use of government contingency contracting to determine if it was effective during the preparations and response to the disaster. For each disaster, we will review:

- Storm/earthquake development and impact
- Preparation plans (local, state, and federal)
- Immediate and long-term response
- Contingency contracting support
- Funding support
- Analysis of response and contingency contracting
- Lessons learned and recommendations

This assessment will examine the 1994 Northridge earthquake that occurred in the Southern California region of Los Angeles County, California, Hurricane Katrina (2005), which brought great devastation to the United States' Gulf Coast, primarily New Orleans,

Louisiana, and the most recent CONUS disaster, Hurricane Sandy, which in 2012 devastated a significant portion of the east coast, especially areas in New York and New Jersey. For each disaster, several factors related to contingency contracting will be discussed in addition to the history of the events. For example, prior to the earthquakes and hurricanes occurring, the impacted cities may have developed contingency contracting or planning methods to prepare for the events. Furthermore, after the events, contingency contracting or planning methods may have been bolstered further.

Additionally, the processes of immediate response for each disaster will be addressed. Immediate response includes the strategies employed by local, state and federal responders, such as communicating to the public, garnering federal interest, and responding to injuries or lives at-risk in the initial hours after the event has occurred. Next, the analysis will discuss the long-term response for each crisis, which includes the local, state, federal, and military actions that occurred subsequent to the immediate response.

Other components of the assessment are the organizational structures and response coordination strategies employed in Northridge, the Gulf Coast, and the east coast when the disasters struck. Various organizational structures and response coordination plans have been used over the years, some more successful than others. An enduring problem with disaster response has been how to effectively coordinate federal, state and local responses to ensure resources are not wasted and efforts are not fragmented and uncoordinated. We will analyze the systems used during these disasters and assess their level of efficiency and effectiveness.

In terms of funding, we will examine the basic sources of funding and what challenges existed getting the funds released for use. These sections will examine what the sources of money are, and the amount awarded in specific areas such as debris removal, sanitation, food and water distribution, construction, rebuilding and demolition.

This report will also consider the types of policy changes that have been implemented as a result of these disasters. All of these disasters, in particular Hurricane Katrina, have contributed to contingency contracting policy changes. Policy changes

include local, state, and federal shifts in policy that are a direct result of response failures and lessons learned.

During all of these disasters, there have been many hard lessons learned and weaknesses exposed in local, state, and federal preparations and response plans. Despite these challenges, there have been many successes also. We will also highlight the areas of strength and success in the disaster responses and particularly in contingency contracting preparations and response.

C. SCOPE OF RESEARCH

Several factors define the scope of this thesis. Contingency contracting has been used many times during the last twenty years in response to CONUS natural disasters (DPAP website). However, in order to maintain focus and in-depth research, we will only report on the three natural disasters already mentioned. Additionally, it should be noted that the three disasters we are reporting on were immense in magnitude and all quickly overwhelmed readily available resources. Had we analyzed smaller disasters, the results of our research would be much different.

We will also largely focus on the responses and contracting actions of the larger federal agencies such as the Department of Homeland Security (DHS), Department of Defense (DOD), Federal Emergency Management Agency (FEMA), and the U.S. Army Corps of Engineers (USACE). The actions of state and local agencies will also be covered, but to a lesser degree when compared to the federal agencies. Given the scale of the disasters we are researching and reporting on, the federal government is the primary source of response coordination when it comes to contingency contracting and funding the costly responses to these disasters. Therefore, we will focus the preponderance of our efforts on federal response.

D. RESEARCH METHODOLOGY

Our methodology consisted largely of literary searches for information on disaster response and contingency contracting information at the local, state and federal level. The use of government websites such as FEMA, DHS, Defense Logistics Agency (DLA), and

the Defense Procurement and Acquisition Policy (DPAP) were very useful for developing background information on standing organizational structures, response plans and contingency contracting policy and regulations.

Government documents such as the Office of Management and Budget (OMB) Emergency Acquisitions Guide, Congressional Research Service (CRS) Stafford Act report, and the DHS National Official Response Plan were also used for our research. After action reports from local, state and federal agencies for each disaster were excellent sources of detailed information on contingency contracting efforts and lessons learned. Other sources of information consisted of local newspaper articles, magazines, and online news sources.

E. ORGANIZATION OF PROJECT REPORT

The organization of this thesis consists of an introduction (Chapter I) that addresses the historical background of contingency contracting, purpose, scope, methodology and organization of the report. Chapter II addresses standing policy and regulations and the various organizations that typically respond to disasters and are involved in the contracting efforts. Chapters III, IV, and V address Northridge, Katrina, and Sandy, respectively. Each chapter follows the same organization, presenting an introduction, the events of the disaster, preparations, response, contingency contracting support, funding, analysis of the response and contingency contracting, lessons learned and recommendations and, finally, a chapter summary. Chapter VI is the final chapter and is titled “Conclusions and Recommendations.” The final chapter compares and contrasts the responses of the three disasters and highlights the lessons learned, repeated failures and areas that have shown improvement. Lastly, we make recommendations for changes to response and contingency contracting policies and regulations.

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II. UNITED STATES DISASTER RESPONSE AND CONTINGENCY CONTRACTING HISTORY

A. INTRODUCTION

If a major theme is indicated from the 1994 Northridge earthquake, the 2005 Hurricane Katrina, and the 2012 Hurricane Sandy, it would be constant evolution in terms of contingency contracting preparations and planning. Based on these events spanning over 18 years, it is evident that contingency contracting planning and execution is constantly evolving. Throughout the past few decades, there have been successes and challenges faced by organizations and agencies involved in CONUS disaster contingency contracting. Therefore, analyzing the evolution of contingency contracting is significant in identifying where organizations went wrong, where they excelled, and what changes were made over time.

B. THE FEDERAL EMERGENCY MANAGEMENT AGENCY

FEMA can trace its beginnings to the Congressional Act of 1803 (FEMA). The Congressional Act of 1803 is generally considered the first piece of disaster legislation and provided assistance to a New Hampshire town following an extensive fire (FEMA). For almost 100 years following the Act, ad hoc legislation was passed more than 100 times in response to hurricanes, earthquakes, floods, and other natural disasters. It appeared that the U.S. wanted to re-invent the wheel with every disaster. It was not until the 1930s that a federal approach to disasters became more consistent. In the 1930s, the Reconstruction Finance Corporation was given authority to make disaster loans for repair and reconstruction of certain public facilities following disasters.

In 1934, the Bureau of Public Roads was given authority to provide funding for highways and bridges damaged by natural disasters. The Flood Control Act, which gave the U.S. Army Corps of Engineers greater authority to implement flood control projects, was also passed. This piecemeal approach to disaster assistance was problematic and it prompted legislation that required greater cooperation between Federal agencies and authorized the President to coordinate these activities. (FEMA)

Through the years, emergency and disaster activities remained fragmented and many parallel programs and policies existed at the State and local levels, compounding the complexity of Federal disaster relief efforts. It was not until the late 1970s that the National Governor's Association sought to decrease the many agencies with which state and local governments were forced to work (FEMA). Therefore, President Carter created executive order 12127 in 1979, in which "merged many of the separate disaster-related responsibilities into the Federal Emergency Management Agency" (FEMA).

FEMA began development of an Integrated Emergency Management System with an all-hazards approach that included "direction, control and warning systems which are common to the full range of emergencies from small isolated events to the ultimate emergency 'war'" (FEMA).

Unfortunately, it took the end of the Cold War and the direction of Mr. James L. Witt to move FEMA toward streamlined disaster relief and recovery operations and a new emphasis regarding preparedness and mitigation and a focus on agency employees' customer service (FEMA). Almost 10 years later, the terrorist attacks on September 11, 2001, moved the agency toward issues of national preparedness and homeland security and tested the agency in unprecedented ways. "The Agency coordinated its activities with the newly formed Office of Homeland Security, and FEMA's Office of National Preparedness was given responsibility for helping to ensure that the Nation's first responders were trained and equipped to deal with weapons of mass destruction" (FEMA).

C. DEPARTMENT OF HOMELAND SECURITY

Congress passed the Homeland Security Act by Congress in November 2002, the Department of Homeland Security (DHS) formally came into being as a stand-alone, Cabinet-level department to further coordinate and unify national homeland security efforts, opening its doors on March 1, 2003. Pennsylvania Governor Tom Ridge was appointed as the first Director of the Office of Homeland Security in the White House. The office oversaw and coordinated a comprehensive national strategy to safeguard the country against terrorism and respond to any future attacks. It has since become so much

more. It was then that “FEMA joined 22 other Federal agencies, programs, and offices in becoming the Department of Homeland Security” (FEMA).

While significant progress had been made between 1803 and 2003, it took yet another disaster to better structure the department.

On October 4, 2006, President George W. Bush signed into law the Post-Katrina Emergency Management Reform Act. The act significantly reorganized FEMA, provided it with substantial new authority to remedy gaps that became apparent in the response to Hurricane Katrina in August 2005, the most devastating natural disaster in U.S. history, and included a more robust preparedness mission for FEMA. (FEMA)

D. THE STAFFORD ACT

Current Contingency Contracting guidance has been derived from the Stafford Act. In an effort to better serve those in need, the government enacted the Robert T Stafford Disaster Relief and Emergency Act (Public Law 93–288 as amended). According to FEMA, the “Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100–707, signed into law November 23, 1988; amended the Disaster Relief Act of 1974, PL 93–288... constitutes the statutory authority for most Federal disaster response activities especially as they pertain to FEMA and FEMA programs” (FEMA).

Both The Stafford and Post-Katrina Acts provide DHS with the guidance necessary to carry out its tasking. By drilling down through DHS, one will discover that the laws have guided DHS to create a multi-tier approach to handle national emergencies. As such, it not only has incorporated the Federal Emergency Management System (FEMA), a National Infrastructure Protection Plan (NIPP) but also an Emergency Services Sector.

The Security Accountability for Every Port Act of 2006 (SAFE Port Act), October 13, 2006 and The Implementing Recommendations of the 9/11 Commission Act of 2007 (Public Law 110–53) were both significant events. The SAFE Port Act built on the Post-Katrina Emergency Management Reform Act of 2006, focusing on the reorganization of the grant process as administered by FEMA. The Act also reorganized intelligence operations at the Department, elevating the Assistant Secretary for

Intelligence and Analysis to the Under Secretary level, requiring Senate confirmation. Additionally, many of the features of the new homeland security architecture align with recommendations contained in the 9/11 Commission Report.

E. THE NATIONAL INFRASTRUCTURE PROTECTION PLAN

The National Infrastructure Protection Plan (NIPP) is comprised of 18 Sector Specific Plans (SSPs) specifically developed to focus on protection of the nation's assets (DHS). It helps to prioritize the nation's Critical Infrastructure and Key Resources (CIKR) and the resources allocated to each CIKR. The NIPP:

provides a unifying framework that integrates a range of efforts designed to enhance the safety of our nation's critical infrastructure. The overarching goal of the NIPP is to build a safer, more secure, and more resilient America by preventing, deterring, neutralizing, or mitigating the effects of a terrorist attack or natural disaster, and to strengthen national preparedness, response, and recovery in the event of an emergency. (Johnson 2)

First released in 2006, the revised NIPP integrates the concepts of resilience and protection, and broadens the focus of NIPP-related programs and activities to an all-hazards environment. It was developed by critical infrastructure partners including federal departments and agencies, state and local government agencies, and private sector entities, but the DHS website does not give a specific list of all participants. The DHS oversees NIPP management and implementation.

In 2010, The Emergency Services Sector Specific Plan was developed (DHS). The Emergency Services Sector-Specific Plan "details how the National Infrastructure Protection Plan risk management framework is implemented within the context of the unique characteristics and risk landscape of the sector" (Johnson 2).

Each Sector-Specific Agency develops a sector-specific plan through a coordinated effort involving its public and private sector partners. The Department of Homeland Security is designated as the Sector-Specific Agency for the Emergency Services Sector.

Each Sector-Specific Plans (SSPs) details how the each sector is to conduct risk management framework is implemented within the context of the unique characteristics and risk landscape of each critical infrastructure sector. Each Sector-Specific Agency has supposedly developed a SSP through a coordinated effort involving its public and private sector partners, yet this group had difficulty finding proof of the collaborative effort.

The NIPP, National Preparedness Guidelines (NPG), and the National Response Framework (NRF) all provide a comprehensive, integrated approach to the homeland security mission. “The NIPP establishes the overall risk-informed approach that defines the Nation’s Critical Infrastructure and Key Resources (CIKR) protection posture, while the NRF provides the approach for domestic incident management. The NPG sets forth national priorities, doctrine, and roles and responsibilities for building capabilities across the prevention, protection, response, and recovery mission areas” (Johnson 2).

The NRF is implemented to guide overall coordination of domestic incident management activities. Figure 1 depicts the NRF table of organization and information flow during incidents and responses. NIPP partnerships and processes provide the foundation for the CIKR dimension of the NRF, facilitating threat and incident management across a spectrum of activities, including incident prevention, response, and recovery. The NPG is implemented through the application of target capabilities during the course of assessment, planning, training, exercises, grants, and technical assistance activities. Implementation of the NIPP is both a national preparedness priority and a framework with which to achieve protection capabilities as defined by the NPG.

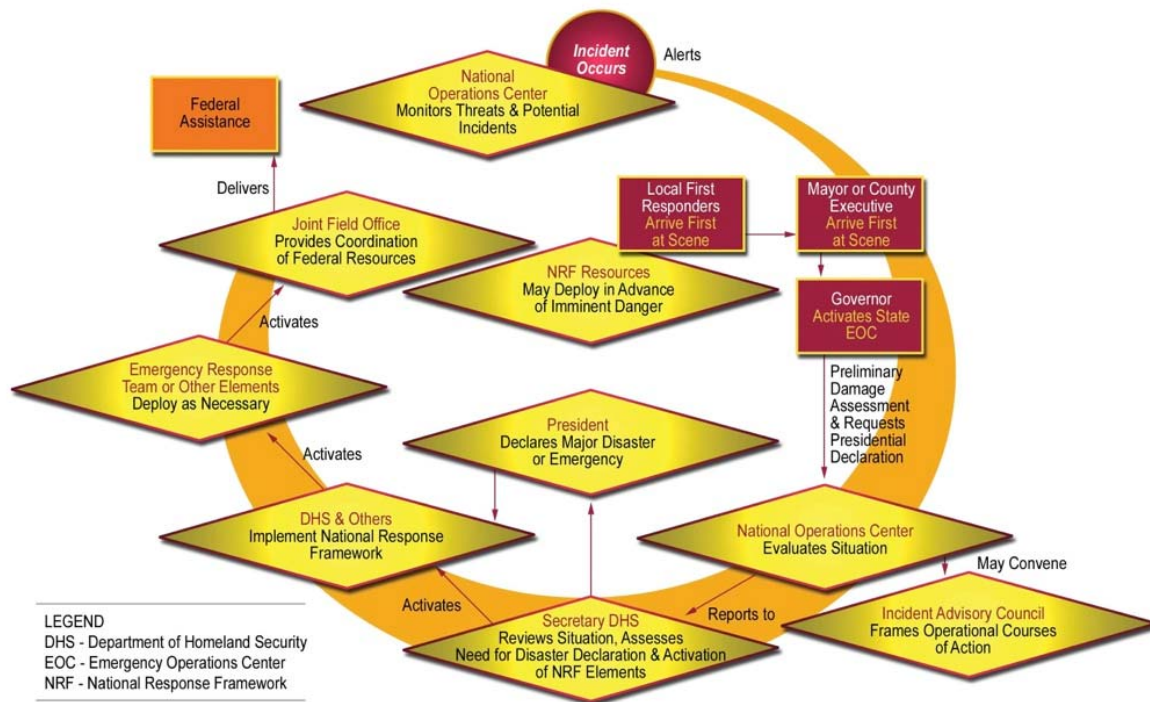


Figure 1. The National Response Framework (from DHS website)

F. CHAPTER SUMMARY

The recent evolution and maturation of disaster response planning within the United States is impressive but prior to 1974 it was cumbersome and fragmented. For about one hundred and fifty years the country plodded through disaster relief, “reinventing the wheel” each time and putting very little effort into establishing a formal response plan. That began to change slowly in the 1900s and with the Stafford Act of 1974, post 9–11 NIPP and NRF plans and post Katrina changes, we have made quantum leaps in planning for and executing disaster relief during the last twelve years. More changes are sure to follow, particularly after we deal with the unknown disasters that the United States will most certainly face in the future.

III. NORTHRIDGE EARTHQUAKE (1994)

A. INTRODUCTION

At 4:30:55 AM Pacific Standard Time on January 17, 1994, a significant earthquake impacted the area 20 miles west-northwest of Los Angeles and one mile south-southwest of Northridge, California (DeBlasio et al. 6). As depicted in Figures 2 and 3, the epicenter of the earthquake occurred at $34^{\circ} 12.80' N$, $118^{\circ} 32.22' W$. According to the United States Geological Survey, the earthquake that hit Northridge, California was a Magnitude 6.7 earthquake. The recorded depth of the 1994 Northridge earthquake is 18.4 kilometers (DeBlasio et al. 6). Experts identify the Northridge Thrust fault line as the main cause of the earthquake; however, several other surrounding fault lines experienced minor rupturing during aftershocks as well as triggered slips (DeBlasio et al. 7).

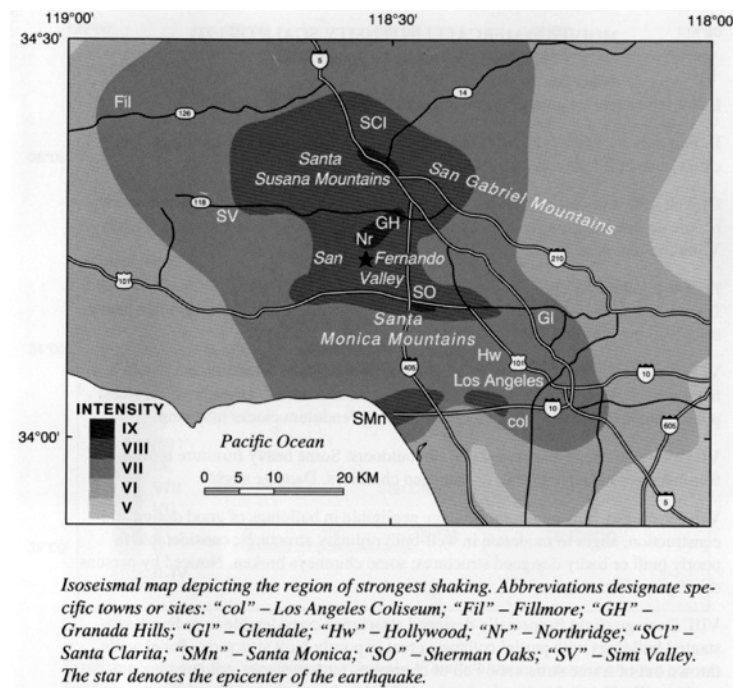
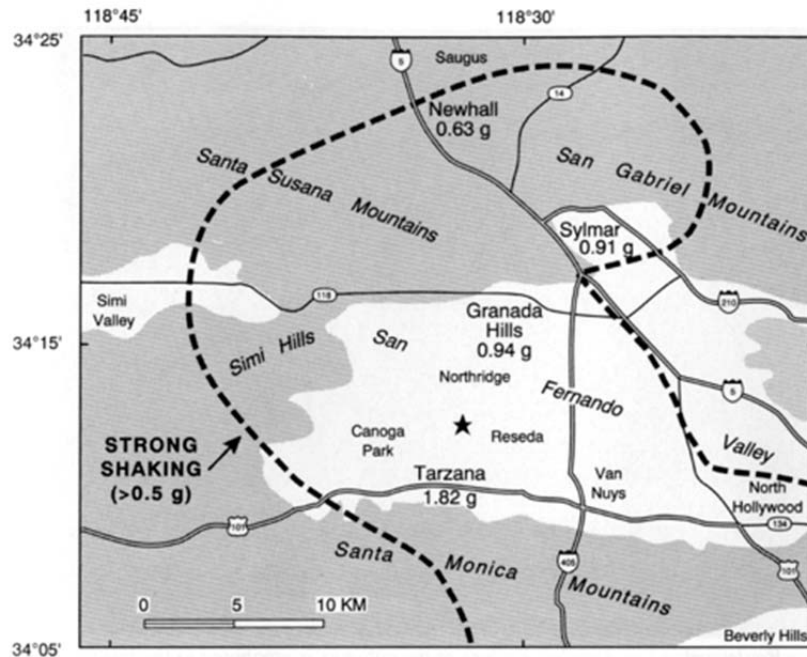


Figure 2. Northridge earthquake epicenter and surrounding areas
(from Dewey 85)



Northridge earthquake location map. The dashed line encloses the area of strongest shaking, where peak horizontal accelerations exceeded one-half the acceleration of gravity. Especially high accelerations are shown for Tarzana, Granada Hills, Sylmar, and Newhall. The star designates the epicenter of the Northridge earthquake, the point on the surface directly above the hypocenter, where the initial rupture on the fault occurred.

Figure 3. Northridge epicenter and surrounding areas
(from Mehmet and Brown 94)

B. THE EARTHQUAKE AND PREPARATIONS

The Northridge earthquake occurred on Monday, January 17, 1994, at approximately 4:30 a.m. in Reseda, a neighborhood in the city of Los Angeles, California. Although earthquakes are common in California, and some are even larger than the recorded 6.7 magnitude of the Northridge event, the significance of the Northridge earthquake was the location of the epicenter, which happened to be in a heavily populated area. Reports demonstrate that more than 2,100 square miles and 50 cities were affected by the Northridge Earthquake (Shinozuka et al. 65). Considering the actual earthquake lasted less than one minute, it was responsible for causing damage to over 114,000 residential and commercial structures and resulted in more than 70 deaths and 9,000 injuries. More than 27,000 people were left homeless (United States

Department of Transportation). It brought the Los Angeles county transportation system to a grinding halt, generating tremendous damage and resulting in a year's worth of construction and rebuilding to repair the infrastructure. FEMA reported initial cost estimates and total damages of the Northridge at \$25 billion (FEMA). The actual cost of the earthquake was set at \$42 billion by the National Oceanic and Atmospheric Administration (NOAA). This made the Northridge earthquake one of the largest and most expensive natural disasters in United States history (FEMA).

While there has been more powerful seismic activity, the Northridge earthquake caused the most large-scale damage throughout the greater Los Angeles area. This was due to the quake epicenter being focused in a highly populated area and a highly traveled transportation area (DeBlasio 7). Damages resulting from the earthquake prompted many organizations and industries to react to issues regarding their specific fields, including water and power, transportation, and debris removal. For example, the Northridge earthquake caused over 300,000 households to lose power, water, or both resources, according to the United States Chamber of Commerce Foundation (4). This substantial loss of utilities was recorded as the largest blackout in Los Angeles history. In addition, sewage systems were also affected for well over a decade after the earthquake hit (Nahai 12). These types of problems call for both short and long-term contingency contracting solutions.

The earthquake caused considerable damage and destruction to the highway system in the San Fernando Valley. It placed an immediate and significant strain on auto-dependent Southern California (DeBlasio et al. 12). Since the highway system is such a significant part of the county infrastructure and transportation corridor throughout Southern California, government agencies responded quickly to the crisis. In fact, California Department of Transportation (Caltrans) was the first to respond with construction contracts to remove rubble and rebuild the county highways and key infrastructure. By the evening of January 17, construction crews had already begun clearing rubble, removing debris, and demolition of irreparable highway bridges (DeBlasio et al. 13). By January 20, the Southern California Regional Rail Authority (SCRRA) increased Metrolink commuter rail ridership to Lancaster in the north and

Ventura County in the west (United States Department of Transportation). The Metropolitan Transit Authority (MTA) changed bus services throughout the county, shuttle services were implemented, highway detours were set up, and many companies offered their employees free shuttle service (United States Department of Transportation). Federal, state, local governments and construction contractors worked in close partnership to reconstruct the highway system in record time. According to the California Department of Transportation (Caltrans)/Federal Highway Administration (FHWA) (1995), “Everyone involved was driven by the desire to be part of the recovery effort, and take pride in showing what we could do” (5).

Caltrans was a leader in the reconstruction effort to rebuild the damaged transportation system. The Department also retained traveler mobility by keeping traffic flowing as smoothly as possible throughout the rebuilding efforts (Federal Highway Administration).

Prior to the earthquake occurring, the area of Northridge, California, had experienced several natural disasters. For example, major wild fires, mudslides, and floods occurred only weeks before the Northridge earthquake. Additionally, less than two years before the earthquake, the Los Angeles area faced riot situations that required contracts from local, state, and federal agencies to aid the State of California in a major disaster. In fact, the Northridge earthquake was the third time in only three months that disaster response was needed in the Los Angeles area. Therefore, one could assume the State of California is well versed in disaster response.

According to the United States Geological Survey, the Northridge earthquake produced the strongest ground motions ever instrumentally recorded in a densely populated region in the United States as well as the entire continent of North America (2014). In the aftermath of the Northridge earthquake, major freeways collapsed, parking structures and office buildings imploded, and countless homes were lost as a result of irreparable damage. In comparison to other U.S. disasters, including 2005 Hurricane Katrina and 2012 Hurricane Sandy, the Northridge earthquake ranks third as one of the most expensive natural disasters in the history of the United States in terms of disaster relief and financial loss (FEMA).

In detail, the damage of the Northridge earthquake included destruction of at least eight freeways in the Southern California region (Federal Highway Administration). One of these freeways was Interstate 5, which is a major interchange in the United States. Because of this reality, hundreds of thousands of Los Angeles citizens lost access to the northern area of the county. Traffic was also deterred in Los Angeles' west side, as the Santa Monica Freeway also collapsed (DeBlasio et al. 13). In regard to landmarks and notable buildings, the Los Angeles Memorial Coliseum was subjected to damage amounting to at least \$44 million. Additionally, the Northridge campus of California State University experienced great devastation as a result of the Northridge earthquake. Perhaps the most alarming statistic from the Northridge event was the amount of people in peril after the earthquake hit. Nearly 700,000 individuals residing in the area requested local, state, or federal assistance (FEMA).

Earthquakes are difficult to predict, and the Northridge earthquake was no exception to this disadvantage. However, contingency planning can address predictable outcomes of future earthquakes based on what was experienced in the past, such as with the Northridge earthquake. Despite the devastation and loss that occurred as a result of the Northridge earthquake, experts predict that California will eventually experience a much larger earthquake with even more detrimental results. Therefore, it is evident that not only the State of California, but also federal disaster response agencies should consider the lessons learned from the 1994 incident and develop strategies to combat even more severe situations that could possibly occur at any time.

For example, earthquake mitigation efforts have been demonstrated over the past 19 years since the Northridge event. One of these improvements is implementing better emergency response. Additionally, hospitals are more structurally sound to deal with the impact of an earthquake and can support the requirement of emergency services needed when an earthquake occurs. As a final preemptive measure regarding the region's earthquake-prone status, the State of California requires that new buildings are built with retrofits, which prevents buildings from collapsing easily and can decrease the amount of casualties in the event of another significant and sizable earthquake (Detwiler 3).

According to FEMA, “For many older facilities, one mitigation option to protect against seismic hazards is the seismic rehabilitation of existing structural elements.” Perhaps the only benefit of the Northridge earthquake was providing lessons to improve the safety and security of the region if another earthquake of this magnitude hits in a densely populated region once again.

As previously mentioned, the Northridge earthquake served as a lesson for local, state, and federal disaster response agencies from which to learn. For instance, one of the lessons learned that was demonstrated by the Northridge earthquake is that when an earthquake hits beneath a densely populated area, it will be subjected to ground motions with peak accelerations approaching the force of gravity, exceeding the levels of shaking anticipated by building codes. Based on this reality, mitigation and preemptive planning to prevent the damage of earthquakes in the region can be conducted more accurately. This is an issue that can be prepared for in advance to prevent destruction and loss of life in subsequent earthquake events. In addition, understanding the requirements for both prevention and response to earthquakes will serve as the foundation for contingency contracting on the local, state, and federal levels.

For example, the Homeland Security Presidential Directive 5 established the guidelines of contingency contracting prior to the Northridge earthquake and is still implemented in the present day. According to the United States Coast Guard (USCG):

As required by Homeland Security Presidential Directive 5 (HSPD-5), the NRF establishes a single, comprehensive approach to domestic incident management to prevent, prepare for, respond to, and recover from terrorist attacks, major disasters, and other emergencies. The NRF is an all-hazards plan built on the template of the NIMS. The NIMS provides a consistent doctrinal framework for incident management at all jurisdictional levels regardless of the cause, size, or complexity of the incident. (Murphy 217)

This National Response Framework is considered by the Department of Defense (DOD) as well.

C. RESPONSE: IMMEDIATE AND LONG TERM

Based on the severity of the 1994 Northridge earthquake, a rapid and robust response was needed to rectify the damage and other issues caused by the event. For example, the Los Angeles County Fire Department deployed its 56-person FEMA Urban Search and Rescue (USAR) Task Force and other resources to assist the Los Angeles City Fire Department and helped manage mutual aid resources from across the nation (FEMA). This was the beginning of a disaster response that would prove lengthy, costly and comprehensive for both the county and the nation. The following sections discuss the local, state, and Federal efforts employed to respond to the Northridge disaster.

All three aspects of government-based disaster recovery—federal, state, and local—were employed to respond to the Northridge earthquake in 1994. Additionally, industry leaders and local organizations applied hands-on support in the earliest phases of recovery. The Secretary of the United States Department of Transportation (USDOT), the Federal Highway Administration (FHWA), the Governor of California, the Director of Caltrans, and the Mayor of Los Angeles were among the major role models during the crisis.

As Table 2 indicates, the immediate recovery response to the earthquake was rapid at all levels. One hour after the Northridge earthquake occurred, the California National Guard headquarters was contacted by the State of California's Office of Emergency Services. This action initiated the California Crisis Action Center (FEMA).

Time	Elapsed Time	Event/Actions Taken
4:30 AM	0 minutes	An earthquake of a magnitude of 6.7 occurred in the Los Angeles area, centered in Northridge. Damage spread over 2,100 square miles and through three different counties.
4:31 AM	1 minute	An aftershock occurred at a magnitude of 5.9.
4:35 AM	5 minutes	Los Angeles City and County Emergency Operations Centers are activated.
4:45 AM	15 minutes	FEMA Response began.
5:45 AM	1 hour, 15 minutes	Los Angeles Mayor Riordan declared a state of emergency.
6:00 AM	1 hour, 30 minutes	FEMA Headquarters Emergency Support Team was activated.
6:45 AM	1 hour, 45 minutes	As many as 50 structural fires were reported, in addition to numerous ruptures in water and natural gas mains. Power outages reported
9:05 AM	4 hours, 35 minutes	California Governor Pete Wilson declared a State of Emergency.
9:45 AM	4 hours, 45 minutes	All active fires were under control.
2:08 PM	9 hours, 38 minutes	President Clinton declared a national disaster for Los Angeles County.
7:00 PM	14 hours, 30 minutes	First of several contracts put in place and crews began work on debris clearance and highway demolition.

Table 2. Northridge earthquake immediate response timeline (from FEMA website)

By employing an Incident Command System (ICS), FEMA was able to coordinate the response of nearly 30 federal agencies to respond to the Northridge earthquake disaster. Collaboration of all of these agencies enabled decisions to be made and processes to occur quickly without bureaucratic interference. Although financial challenges were present, the cooperation of FEMA and the other several agencies coordinating the disaster relief were able to overcome them and respond in a timely fashion. FEMA contributed greatly toward the response to the Northridge disaster by distributing emergency equipment and supplies at various locations. Additionally, FEMA established an Earthquake Service Center that consisted of specialists from disaster agencies on local, state, and federal levels. Once this center was operating, it provided aid to victims continuously through the next several days. FEMA was a valuable component

of the restructuring processes as well. For instance, FEMA's insight into transportation and financial decision making was vital. In addition to rebuilding after the disaster occurred, FEMA executed stellar communication to the public, disseminating information pertinent to safety and survival, which may have diverted hysteria or other unproductive behaviors, such as rioting, looting, etc., in the Los Angeles region (FEMA).

One of the greatest impacts from the Northridge earthquake was the destruction of highways and freeway systems vital to the effective transportation of Los Angeles residents (Figure 4). Prior to the Northridge earthquake occurring, Federal highway aid was implemented by the Federal Highway Administration (FHWA) in 1977 and the FHWA forged a strong relationship with Caltrans, the state-operated transportation organization in the State of California (DeBlasio et al. 14). This partnership developed the Federal Aid Highway Program, which would play a significant part in rebuilding the freeways in California in response to the Northridge earthquake almost 20 years later (DeBlasio et al. 14).



Figure 4. Northridge earthquake freeway damage (from Mehmet and Brown 98)

Once the Northridge earthquake occurred, the preemptive measures of the FHWA and Caltrans proved beneficial. Immediately after the Northridge earthquake, \$45 million was provided for debris cleanup as well as demolition efforts (Federal Highway Administration). Additionally, the organizations designated nearly \$100 million for transit funds, specifically regarding the Metrolink public transportation system and freeway rebuilding endeavors. At the end of the rebuilding project, the FHWA estimated approximately \$350 million was released to respond to the destruction of the Northridge earthquake.

Loss of power and water were major issues after the earthquake occurred. Not only were many individuals, families, and even businesses affected by a disruption in power and water supply, it challenged response teams because inadequate communication was available with the resulting electrical blackout, and without water, rescue efforts were strained. Thus, an immediate need to restore utilities, including telephone lines, existed. In the immediate aftermath of the earthquake, the Caltrans Traffic Management Center (TMC) used backup electrical generators for power and relied on landline telephones for primary communications to coordinate their efforts (Quake 29). Additionally, the Los Angeles Department of Water and Power (LAWAP) played an instrumental role in immediate response to restore both power and water to the greater Los Angeles area (Nahai 9). Figure 5 demonstrates the success in power restoration after the earthquake made by LAWAP and indicates that power was restored to 100% of their customers within four days of the earthquake, a very impressive figure when compared to Hurricane's Katrina and Sandy where it took months to restore all electrical power (Shinozuka et al. 73).

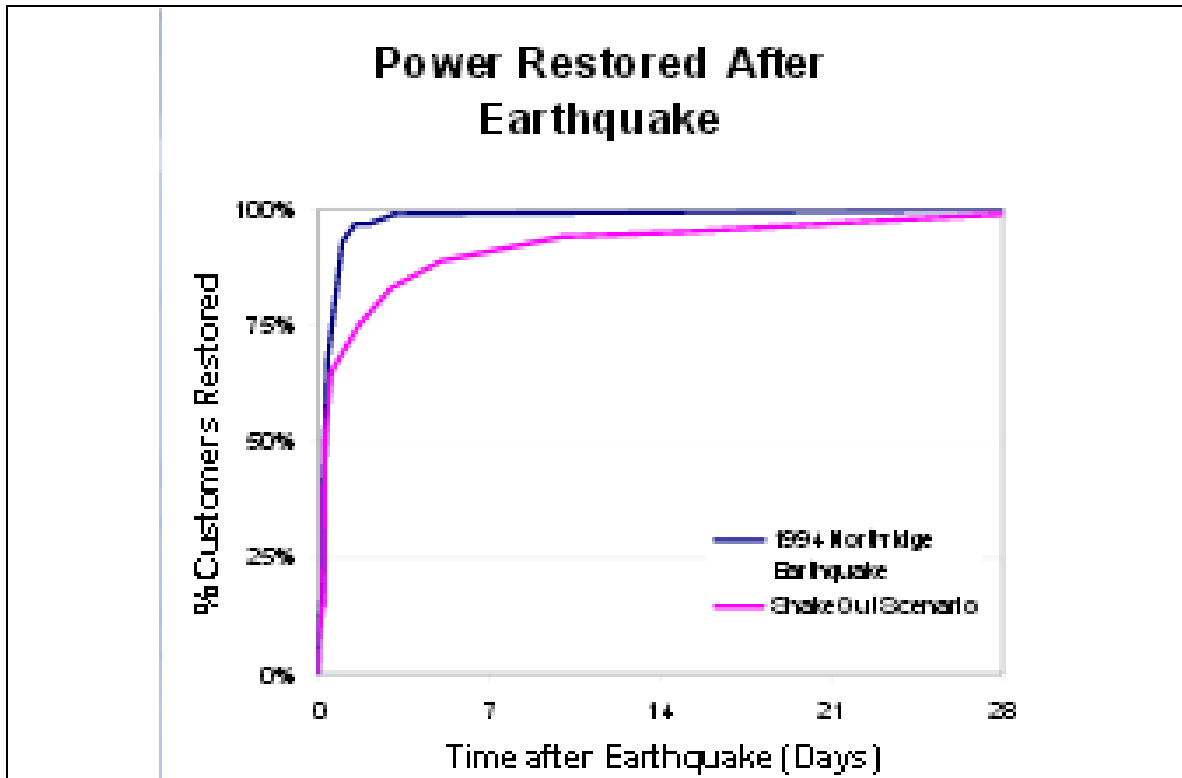


Figure 5. Northridge earthquake, power restoration timeline (from Shinozuka et al. 73)

D. ORGANIZATION AND LEADERSHIP

The organizational structure and leadership that existed once the Northridge earthquake occurred was effective. The Northridge earthquake presented a need for an effective incident management model. In conjunction with leadership and organization from FEMA and an Incident Command System (ICS), which is a standardized incident management approach, an all-risk system was developed to address the specific needs of the Northridge earthquake damage (FEMA). FEMA, utilizing an ICS led the overall California response to the earthquake and by most accounts was effective.

Preparation and past key events were significant aids in the organization of the Northridge earthquake response. For example, the City of Los Angeles already had established an Emergency Operations Center (EOC) after the Los Angeles riots that had occurred only two years prior to the Northridge earthquake. Because of the EOC's existence, rapid organization and a coordinated response occurred quickly when the

Northridge earthquake hit the region. Within five minutes of the initial earthquake tremors in Northridge, the EOC was alerted and began earthquake operations (FEMA). For instance, the EOC initiated vital decision-making processes and facilitated the flow of information through productive communication channels. Within the communication networks, local public works agencies, fire departments, police departments, building and safety organizations, and the local transportation agency, Los Angeles Department of Transportation (LADOT) began cooperating with city officials and the office of the Mayor of Los Angeles. In addition to the organization and leadership of these organizations, further assistance and leadership was presented by the Los Angeles County Sheriff's Department, the California Highway Patrol (CHP), Caltrans, and the Los Angeles Metropolitan Transportation Agency (MTA) (Department of Transportation).

The next level of organization and strategy included a rescue plan that consisted of rescue efforts, debris removal, and demolition. This plan proved to be effective and efficient and it clearly defined each organization's role in rescuing and reviving the city. Due to the evolving conditions of the situation and environment during the rescue efforts, the plan was regularly updated to reflect the understanding of the unique needs of the situation. The guidance from the leaders identified previously was significant in terms of effectiveness and ensuring the safety of rescue crews (FEMA).

E. CONTINGENCY CONTRACTING SUPPORT

Because of the burden placed on the transportation system of Southern California in the wake of the Northridge earthquake, contingency contracting was necessary to respond to the devastation. Only 15 hours after the earthquake occurred, the first contracts were initiated, prompting the beginning of lengthy and costly efforts to conduct demolition efforts and remove debris (United States Department of Transportation). Some of the more significant contracts executed for the earthquake response were for supporting Caltrans. Once Caltrans completed its analysis of the damage of the major transportation systems, contracts were developed and awarded to initiate the rebuilding of the damaged highway networks (United States Department of Transportation).

When developing debris removal contingency contracts, the State of California follows specific criteria. The first step in estimating costs is preparing an estimate of the types and quantities of debris to be removed. Secondly, the analysis must identify the locations of the debris. The final phase of analyzing what is typically needed to develop contracts is the determination of unit cost data for the contracted item (Mortenson 222). With a significant amount of building demolition required in the greater Los Angeles area, contingency contracts were used with great success during the Northridge earthquake response. The City of Los Angeles and the State of California required contracts to address recycling of demolition materials to the greatest extent without delaying the demolition project, which helped restore the region more expediently. The contract provisioning was uniform and consistent across multiple agencies. Some examples of the contract provisions are as follows:

- “Summarize and document the amounts and types of materials directly recycled and material removed from the site on the enclosed recycling log found within this Contract. Documentation includes receipts of materials sold, etc.”
- “Identify loads to (site) as “City Demolition Debris,” state the demolition site address, and pay all allocated fees. Copies of weight tickets from the previous day’s work will be collected at the demolition site on a regular basis by a representative from the Integrated Solid Waste Management Office. Copies of weight tickets must also be turned in to the Engineer at the completion of the project.” (Mortensen 223)

Both the city and state issued contracts that addressed debris removal as a unit price contract. The following contract provisions are related to recycling disaster debris:

- “Incentive payment: The City will pay tipping fees using the existing authorization letter; however, only source separated recycling facilities and (name of recycling facility) (mixed debris recycling) will be authorized. Contractors will receive an incentive (10% of unit price) to use source separated facilities, since the City saves over \$200 per load when using these types of facilities.”
- “Collection plan: The Contractor will submit a “Collection Plan” that details how the debris will be collected as well as specifics on equipment and personnel that will be utilized.”
- “City Inspectors will ensure that the Contractor implements the Collection Plan. This will include ensuring that all debris is collected, that Contractor mobilized equipment greater than or equal to equipment bid in Collection

Plan, as well as ensuring that the Contractor conducts work in a safe manner.” (Mortensen 223)

As stated earlier, the Northridge earthquake presented the largest blackout ever seen by the Los Angeles area, however, effective contingency planning and contracting enabled swift restoration of power throughout the area (Shinozuka et al. 78). Restoration of electricity throughout the area was made possible through contingency planning as well as both pre-event and post-event assessments and rehabilitation strategies on behalf of the Los Angeles Department of Water and Power (LAWAP).

According to Shinozuka et al. in 2003, system performance criteria and requirements of LAWAP include a majority of preparedness and restoration regarding power, water, and hospital resources. For example, prior to an event occurring, the reliability of power, water, and hospital resources are all at 99% per year (Shinozuka et al. 72). Additionally, post-event response and recovery demonstrates high rates of reliability for power, water, and hospital resources, which show a 90% success rate on behalf of LAWAP (Shinozuka et al. 72). Furthermore, the swiftness in restoration of power, water, and hospital resources during events comparable to the Northridge earthquake indicate that power is usually restored in 95 percent of households within three days, water is restored in 95 percent of households within three days, and all emergency facilities are restored within 24 hours (Shinozuka et al. 74).

More specifically, response regarding water and power during the Northridge earthquake was incredibly effective as a result of accurate and comprehensive contingency contracting. In fact, most power and water resources disabled by the earthquake were restored within the first 24 hours after the event, demonstrating that despite the magnitude of the earthquake and the size and affected radius of power and water disruption, LAWAP was able to eradicate the issues with water and power supplies quickly with sound contingency contracting in place. Contingency contracting efforts in this instance include risk assessment, business impact analysis, defining and selecting strategies of response, planning development and execution, and routine testing or exercising the plan to ensure relevancy (U.S. Chamber of Commerce).

Contingency contracting to restore immediate sewage issues resulting from the Northridge earthquake were equally effective; however, long-term damage was experienced in the Los Angeles area for over a decade after the earthquake. For instance, in 2003, the City of Los Angeles established a contract of nearly a million dollars to make repairs that were not deemed emergencies in 1994. Once the contract was established, excavation, shoring up and replacement of sewer systems commenced (Los Times Staff Reports). In addition, residential sewer systems were restored, including housing sewage connections (Times Staff Reports).

F. FUNDING

As previously mentioned, the Federal Highway Administration released funds immediately to address the destruction of the highways as well as debris removal and demolition efforts. Caltrans was then tasked with completely rebuilding the freeway network to sustain the traffic patterns that occurred prior to the Northridge earthquake. These contracts were made in good faith (DeBlasio et al. 10).

A significant good faith contract was set in place to address traffic management and reengineering. In the good faith contract that was developed with the Caltrans engineers, a Traffic Management Plan (TMP) was created. Within this TMP, efforts to coordinate traffic operations for the entire Los Angeles region were addressed. Additionally, according to (DeBlasio et al. 10):

- The Caltrans TMC was the initial site of traffic management following the earthquake. Besides its traffic monitoring capabilities (CCTV and traffic counters), the TMC deployed the FSP, which is jointly run by Caltrans, the LADOT, and the CHP. As was discussed earlier, directly following the earthquake, the FSP deployed 157 tow trucks to the regional freeway system and extended their regular peak commute hours. The tow trucks were equipped with radios and a mobile traffic data terminal, which allowed the drivers to communicate with dispatchers at the TMC. In January 1994, the freeway service patrol assisted about 1,250 motorists. That number peaked at about 4,100 in March 1994, or 14,898 total motorists from January–May 1994.

The reconstruction was primarily funded by this good faith contracts as well as emergency reserve funds that were established in the event of an earthquake or other natural or societal disaster was to occur.

In terms of funding debris and demolition of buildings in residential and commercial areas, FEMA responded by funding these endeavors as well as tipping fees and the cost of administration personnel and contractors (Table 3). Additionally, FEMA provided funding for recycling, as it is the policy of the State of California, specifically the City of Los Angeles, to reduce litter and recycle. These policies were overseen and implemented by the California Integrated Waste Management Board (CIWMB), which has since been disbanded and reformed and is currently known as the California Department of Resources Recycling and Recovery (Quake 29).

FEMA FUNDING in USD billions		
Individual Assistance:		
Temporary housing, emergency home repairs, mortgage assistance	1.193	1.424
<i>Personal property replacement, permanent repairs, transportation, medical and funeral expenses</i>	<i>0.167</i>	
<i>Disaster unemployment assistance</i>	<i>0.009</i>	
<i>Housing inspection services</i>	<i>0.023</i>	
<i>Crisis counselling</i>	<i>0.032</i>	
Public Assistance		
Payments to state and local governments for repair and replacement of damaged infrastructure, emergency services and debris removal		4.578*
<i>Mission assignments to other federal agencies</i>		<i>0.020</i>
<i>Administrative costs</i>		<i>0.194</i>
<i>Hazard mitigation measures</i>		<i>0.741</i>
Total FEMA relief costs		6.957

Table 3. Northridge earthquake, FEMA funding. Note that items italicized have not been included in the direct loss estimate (from FEMA website)

*Estimated portion of direct loss reimbursements for public assistance program = USD 4 billion.

This excludes indirect loss reimbursements, such as debris removal and emergency services.

Table 5 sets out the current details of reimbursements from FEMA, dated January 31, 2000, totaling USD 6.957 billion. Other federal expenditure amounted to USD 6.043 billion, of which some costs relate to the Small Business Administration loans and hazard mitigation projects. Direct reimbursements from FEMA have been estimated at USD 5.193 billion and those from other agencies USD 1.098 billion, totaling 6.291 billion for direct federal reimbursements. By the close of 1994, FEMA reported that some 667,801 Southern Californians had applied for federal aid, three times as many as following Hurricane Andrew in 1992.

Although FEMA plays a key role in disaster assistance; other agencies such as the Small Business Administration (SBA) U.S. Department of Agriculture (USDA), Department of Housing and Urban Development (HUD), U.S. Department of Transportation (DOT) U.S. Department of Interior (DOI) are among those that also play a role. See Table 4 for a high-level breakdown of the major federal agencies that received funding in the aftermath of the Northridge earthquake (Quake 29).

Department of Housing and Urban Development (HUD)	USD 0.837 billion
Department of Interior—historic preservation work	USD 0.005 billion
Department of Education	USD 255.6 million
Federal costs unaccounted for	USD 0.864 billion.
TOTAL	USD 1.098 billion

Table 4. Northridge earthquake, major federal funding by department
(from FEMA website)

G. ANALYSIS OF RESPONSE AND CONTINGENCY CONTRACTING

The Northridge earthquake presented various challenges that needed to be addressed as soon as possible in an effort to restore the Los Angeles area back to its original state and functionality. In regard to transportation, there were numerous closures and downed thoroughways. For instance, all lanes were completely shut down for a significant portion of the Interstate 5 Freeway. In the first few days after the earthquake occurred, only the trucks-only lanes were undamaged on Interstate 5. State Route 14 lanes were closed. Additionally, all Interstate 10 lanes were closed for several miles. In an effort to respond to these significant roadway closures, demolition, and debris removal, drivers were directed through local streets as detours. However, this drastically altered the traffic patterns and times of arrival of commuters around the city.

Debris removal was a significant issue during the Northridge earthquake recovery (Figure 6) and one of the major problems identified by the city of Los Angeles is that it did not have a contingency plan for debris management prior to the earthquake. Immediately following the earthquake, the city quickly developed a debris management program. A curbside debris collection program was instituted to start the cleanup process.

Debris collection was mixed with trash, construction material, and organic material in pick up containers. Construction and demolition debris on normal collection days prior to the earthquake made up to 15 percent of the city collected waste (Quake, 4). Prior to the earthquake, construction and demolition waste comprised of 150 tons of waste per day. Following the earthquake, the city collected as much as 10,000 tons of construction and demolition waste on a daily basis (Quake, 4).



Figure 6. Debris removal of destroyed California freeways was a massive undertaking (from Mehmet and Brown 95)

Before the earthquake city contracts for debris removal were mere two pages long and contracted for one week of work. The initial contracts allowed the city to begin removing debris quickly, but it did not include a recycling clause or other requirements such as separating like materials in different container for easy haul away. After the earthquake, the contracts grew to 22 pages. The city reduced the logistical foot print by assigning each contractor a certain block or set of streets to clear.

After two months of negotiating with City of Los Angeles, FEMA allowed the city to incorporate recycling as a debris removal method. The city and FEMA based their

decision on the city's local policy to support recycling and it documented a pilot program that stated a potential 82 percent recycling rate. The city issued contracts that required contractors to separate collections of wood, metal, dirt, concrete and asphalt, and red clay brick. Any debris that could not be separated at the site of collection was sent to facilities that separated the debris allowing them to recycle at least 80 percent of the mixed debris. The City of Los Angeles was largely self-sufficient in collecting, separating, recycling, and managing its earthquake debris. The city took its debris collection process a step further by setting up an agreement between the city and FEMA to allow the city to obtain assistance from United States Army Corps of Engineers (USACE), the State of California, and other states should the need arise.

This inconvenience and challenge influenced other challenges in the city. For instance, on the ninth day after the earthquake, Metrolink ridership increased 22,000 boardings per day along the new extension of the Santa Clarita rail line serving areas surrounding earthquake-damaged roads. This presented a challenge because the average boardings per day prior to the earthquake were estimated at 1,000. Therefore, the transportation agencies had to prepare for a drastic influx in public transportation accommodations for 21,000 new passengers.

Despite the volume of challenges the region experienced as a result of the Northridge earthquake, many successes also occurred. For example, the FEMA Special Facility Teleregistration Center was activated. By the fifth day after the earthquake, the initial contracts written to clear debris and repair Interstate 10 northbound and southbound connectors to Interstate 405 were completed allowing them to reopen. By the twelfth day, the southbound State Route 14 to southbound Interstate 5 truck bypass opened with one High Occupancy Vehicle (HOV) lane and one mixed flow lane, which alleviated some of the most significant traffic delays experienced in the first week of the earthquake response. At the end of January 1994, lane capacity in the damaged roadway corridors is restored to 70 percent of the level existing prior to the Northridge earthquake (DeBlasio et al. 15).

In the beginning of February 1994, a regular system of detours and emergency express bus services were in operation. Another success experienced after the Northridge

earthquake was that construction on Interstate 10, Santa Monica Freeway, was started, less than a month after the earthquake. Shortly after construction on Interstate 10 began, construction on Camarillo Metrolink began as well. A number of previously downed roadways were restored and reopened after only two months, including the westbound State Route 118 and Interstate 5, Golden State Freeway at Gavin Canyon.

However, the greatest successes are evident in that the organization and leadership throughout the rescue and rebuilding phases of the Northridge earthquake aftermath were able to generate improvements ahead of schedule, demonstrating the commitment to rebound effectively from the disaster. For example, the Interstate 10 Santa Monica Freeway opened 74 days ahead of schedule. The Interstate 5/State Route 14 Interchange reopened three weeks ahead of schedule. The State Route 118 Simi Valley Freeway westbound lanes opened more than two weeks ahead of schedule. Only two roadways were altered until the end of 1994, including the eastbound State Route 118 lanes and the remaining two ramps at the State Route 14/Interstate 5 Interchange; however, all roads were restored by the end of the year, only 11 months after the Northridge earthquake occurred.

H. LESSONS LEARNED AND RECOMMENDATIONS

After assessing the damage of the Northridge earthquake, changes were needed to ensure the safety and effectiveness of first responders and rescue teams. For instance, confined space rescues required the need for rescuers to understand the possibility of an explosion occurring. To respond to these fears, vapor suppression and positive pressure ventilation had to be maintained. Additionally, prior to allowing rescue teams to enter vulnerable situations, safe zones and evacuation routes were outlined in the event that a secondary collapse occurred while rescue teams were present. This marked circumstance-based confined space rescue strategies that would allow teams to assist the injured while preventing further injury.

Several other changes were made to reflect contemporary circumstances and to promote the safety of the response teams. For instance, rather than using firefighting helmets, rescue teams during the Northridge earthquake rescue wore construction-style

helmets. The Northridge earthquake allowed rescue teams to find that wearing jumpsuits was more effective in the confined space situations than turnout gear. The rescue teams practiced methodical lifting and cribbing efforts to ensure the safety of the scene as well as obtain insight into the effects of the earthquake on various structures. Rescue personnel was continually assessed and evaluated to ensure their well-being and effectiveness. Coordination efforts were orchestrated by using color-coordinated hose lines.

The City of Los Angeles instituted a city wide plan for debris management. A curbside debris collection program was introduced that required contractors to include recycling or a separation method. Debris collection was separated in to trash, construction material, and organic materials for pick up at curb side. Contracts included a recycling clause or other requirements such as separating like materials in different container for easy haul away.

I. CHAPTER SUMMARY

When any natural disaster occurs, contingency planning plays an essential role in both preparedness and response. Considering California is a location that is prone to experiencing earthquakes, the contingency planning efforts in place at the time of the event were quite effective. For example, a mere 15 hours after the earthquake occurred, the first contracts were initiated, prompting the beginning of lengthy efforts to remove debris and employ demolition efforts. Among the many contracts that were created for the response was California Transportation (Caltrans). Once the Caltrans completed its analysis of the damage of major transportation systems as a result of the Northridge earthquake, good-faith agreements were made to begin rebuilding highway networks immediately (DeBlasio et al. 10). The purposes of these agreements were to summarize and document recycling and debris removal efforts, requirements for debris removal, and relocation standards for removing debris as well as recycling matter that was affected by the Northridge earthquake.

Additionally, a significant good faith contract was set in place to address traffic management and reengineering. In the good faith contract that was developed with the

Caltrans engineers, a Traffic Management Plan (TMP) was created. Within this TMP, efforts to coordinate traffic operations for the entire Los Angeles region were addressed.

All three aspects of government-based disaster recovery—federal, state, and local—were employed to respond to the Northridge earthquake in 1994. Additionally, industry leaders and local organizations applied hands-on support in the earliest phases of recovery. A total of \$1.098 billion were allocated in the wake of the Northridge quake. This includes \$.837 billion, \$.005 billion, \$255.6 million, and \$.864 billion dedicated to the Department of Housing and Development, the Department of Interior, the Department of Education, and unaccounted for funds, respectively.

In conclusion, the organizational structure and leadership that existed once the Northridge earthquake occurred was generally effective. The Northridge earthquake presented a need for an effective incident management model. In conjunction with leadership and organization from FEMA, the Incident Command System (ICS), which is a standardized hazards incident management approach, an all-risk system was developed to address the specific needs of the Northridge earthquake damage (FEMA). The lessons learned from this earthquake, and both the positive and negative planning strategies executed, provide a foundation for better preparedness in the future.

Despite the effectiveness of the response and contingency contracting related to the Northridge earthquake, one of the significant criticisms about this event was the absence contingency plan for debris management prior to the earthquake. This is important for future contingency planning because future plans and response efforts are based off of predictable outcomes of previous earthquakes. When evaluating the response and contingency planning that occurred after the Northridge earthquake, future efforts can be based on both the successes and failures; successes should be emulated, and failures should be amended for future events. Thus, it is evident that not only the State of California, but also federal disaster response agencies should consider the lessons learned from the 1994 incident and develop strategies to combat worse situations that possibly could occur at any time.

IV. HURRICANE KATRINA (2004)

No hurricane in recent history evokes more emotion and dread than Hurricane Katrina. Katrina struck the continental United States on August 23, 2005 and was the deadliest hurricane in the United States since 1928 with 1,833 deaths and thousands of injuries. Katrina was also the costliest natural disaster in the history of the United States, causing over \$81 billion of damage—more than triple the amount of the infamous Hurricane Andrew in 1992. Katrina began life as Tropical Depression Twelve on August 23, 2005 in the vicinity of the Bahamas and began moving westward toward Florida, reaching Category 1 status just prior to landfall around Hallandale Beach, FL. Damage in southern Florida was minor but as the storm crossed into the Gulf of Mexico, it rapidly gained in strength and size due to the warm waters of the Gulf. After reaching Category 3 status, the storm took only nine more hours to reach Category 5, the highest level on the Saffir-Simpson Hurricane Scale.

Crossing the Gulf of Mexico, the storm turned northward and targeted the Louisiana/Mississippi border area for landfall, fortunately decreasing in strength to Category 3 just prior to making landfall (Figure 7). Despite the warnings from state and federal governmental agencies, most residents did not evacuate the low-lying coastal areas and within hours these areas were flooded for miles inland. However, the worst was yet to come and as the storm assaulted the New Orleans area, the levee system built to hold back flood waters from areas at or below sea level rapidly began to breach and fail. What resulted was later determined to be the worst civil engineering disaster in the history of the Army Corps of Engineers (USACE), who were the designers and builders of the levee system.



Figure 7. Hurricane Katrina making landfall (from NOAA website)

As illustrated in Figures 7 and 8, Katrina maintained Category 3 strength until over 150 miles inland and around Meridian, Mississippi, was finally downgraded to a tropical storm and then a tropical depression near Clarksville, TN. The storm eventually dissipated in the Great Lakes region on August 31 and remnants continued to affect areas of Canada for several days afterward.

As Katrina moved on, the extent of damage and flooding quickly became known to the world. The coastal areas within several hundred miles on either side of the eye of the storm were devastated with boats found miles inland from the incredible storm surge. The breaching of the levees in New Orleans was without a doubt the most catastrophic event of the storm and one that will be etched in the memories of Americans for many years to come. Those that witnessed the devastating hurricane and the flooding that quickly followed described New Orleans as “a ghastly Atlantis where people huddled on rooftops and bodies floated in the streets, as neighborhood after neighborhood succumbed to a relentless, creeping flood” (Block and Cooper 3). As New Orleans flooded, over 30,000 residents sought refuge in the Superdome, the home of the New Orleans Saints. The facility lacked adequate sanitation facilities for any type of extended stay and after

several days, was in abysmal condition and was health hazard that took years to fully repair.



Figure 8. Hurricane Katrina at full strength, just prior to landfall in LA (from Ferrell 3)

A. INTRODUCTION

Some would call Hurricane Katrina the perfect storm; it was not. Instead, it was actually the failure and destruction of New Orleans' levee system actually caused the most tremendous damage to the city. Due to mismanagement and poor state of its levee systems, corrupt politics that endured for years in the state of Louisiana, lack of preparation for the hurricanes and the lack of a plan on what to do when a "perfect" storm did in fact hit the area.

In 2004, the state of Louisiana received funding and permission to begin developing plans for the natural disaster scenarios on the national scenario list. Hurricane Pam was developed and selected as the Emergency Responder's test subject because the greater New Orleans area faces a triple threat when it comes to sources of flood risk: the Mississippi River, rain, and hurricane storm surge. Hurricane Pam was the name given to the exercise conducted a year prior to Katrina. Pam was designed to get local and federal disaster responders thinking about how they might deal with the aftereffects of a

catastrophic storm that hit New Orleans. It utilized computer modeling simulating a category 5 “perfect storm” that supposedly hit New Orleans, ironically taking the actual path of Katrina. The discussions that ensued and plans that were discussed during the Hurricane Pam exercise never garnered the attention of state and city officials. Regrettably, the lessons learned from the simulation were filed away instead of studied and acted upon. The aftermath of Katrina and the subsequent failed levees could have been avoided with some pre-placed funding and training for the emergency response teams.

In an effort to stave off catastrophic destruction from hurricanes, the federal government has ‘dumped’ hurricane plans on the state over the years, and they are all hundreds of pages long, thick with appendixes and crammed with dense, jargon-filled prose. Most of them were created by government staffers in Washington; a few were created without any local input at all. Most sit unread in disaster offices throughout southern Louisiana (Block and Cooper 3).

Unfortunately, the common practice among governmental bodies in Louisiana was to accept such studies without comment, agree to adopt them by unanimous vote, and store them on a shelf, along with the budget books and other publications created by local bureaucracy (Block and Cooper 3).

Ultimately, there are three state entities that have responsibility for the levees of New Orleans: The Sewerage & Water Board which runs the program, the Army Corps of Engineers which builds the levees, and the Levee Board which is responsible for levee maintenance, mowing the grass and painting the walls and making sure nothing leaks (Block and Cooper 4).

For the first 120 years of its existence, the Army Corps of Engineers had a standing mission: to expand and bring rigor to the nation’s navigation system. But beginning in the late 1920s, the Corps took on the additional role of overseeing flood control projects and protecting communities from disaster. Though its payroll was large, the Levee District was basically reduced to a landscaping operation, responsible for

mowing the grass on the levees and reporting any problems to the Army Corps of Engineers (Block and Cooper 7).

The state continuously requested funding for the legitimate purpose of maintaining the shipping lanes of the Mississippi River and to keep the occupants of New Orleans safe. “In the past, there’s no question Louisiana got more federal money per capita than any other state in the union except Alaska,” said Tommy Boggs, the son of Hale and former congresswoman Lindy Boggs and a powerful Washington lobbyist himself (Block and Cooper 7). The problem was that the money that was sent to Louisiana did not always get used for its intended purpose. It is alleged that the delegation of the state held tremendous sway over the purse strings on Capitol Hill, primarily through the ministrations of senior members such as Senators Russell Long, J. Bennett Johnston, and John Breaux, along with House members such as the late majority leader Hale Boggs, the former Appropriations Committee chairman Bob Livingston, and Billy Tauzin, who served as chairman of the Commerce Committee. These politicians dominated the process of bringing home water pork and were responsible for grabbing outsized amounts of money for the state, such as the \$410 million they snagged for the corps’ Orleans District in 1999. Yet no notable improvements were made to the levee system nor were there contracts pre-positioned in case of emergency.

The city of New Orleans has an inherent vulnerability to flooding. The city was built on a swamp and is below sea level. In addition, “the city’s drainage system was designed exactly backward” (Block and Cooper 12). In order to keep the city from being flooded daily, the pumps within the levee system suck runoff out of the city and push it north. Unfortunately, in New Orleans, north is downhill and all three of these canals used to funnel water away from the city are buttressed by floodwalls, massive piles of earth, sheet piling, and reinforced concrete that look like just about the strongest structures known to man (Block and Cooper 12).

When a Gulf hurricane approaches, the possibility arises that the system might reverse itself: the outfall canals would become intake canals and instead of storm water moving out of neighborhoods and into the lake, a storm surge might enter the narrow race

and blast through the middle of the city. Even a “mild” hurricane could send a storm surge gushing over the canal floodwalls. If that were to occur, the pumps at the end of the three canals would not be able to overpower a rushing tidal current.

From the mid-1960s through the early 1990s, the Army Corps suggested that the three canals be outfitted with swinging floodgates that could be shut in the face of a hurricane threat. But in the end, through a combination of sheer stubbornness and sly politics, the Sewerage & Water Board prevailed with its policy of building ever more expensive and elaborate floodwalls to keep the canals at bay instead of building floodgates as the Army Corps of Engineers suggested (Block and Cooper 25).

Despite thirty years of work and \$650 million in contracts, the city’s hurricane protection system was still not complete in 2005, and it had been ten years since engineers had done any serious work on the network of canals. To make matters worse much of the city’s vaunted levee system, mandated by Congress to provide no more than Category 3 hurricane protection, remained untested (Block and Cooper 25).

Ultimately, the requisite information had been gathered, funding had been received, and some were willing to work in order to prepare for a large destructive storm, but instead, state and local officials did virtually nothing to prepare for a major storm.

B. THE HURRICANE AND PREPARATIONS

Hurricane Katrina made landfall on the Gulf Coast of the United States on August 29, 2005. When the hurricane finally reached the coast, it had grown into a Category 3 hurricane according to the Saffir-Simpson Hurricane Scale and was approximately 200 miles wide and is illustrated in Figure 9. More specifically, the hurricane demonstrated winds at approximately 100 to 140 miles per hour. Once Hurricane Katrina breached the New Orleans, Louisiana area, rain already had been falling for several hours. The city was given ample time to evacuate prior to the storm surge. The city was described “as a ghastly Atlantis where people huddled on rooftops and bodies floated in the streets, as neighborhood after neighborhood succumbed to a relentless, creeping flood (Block and Cooper 6).

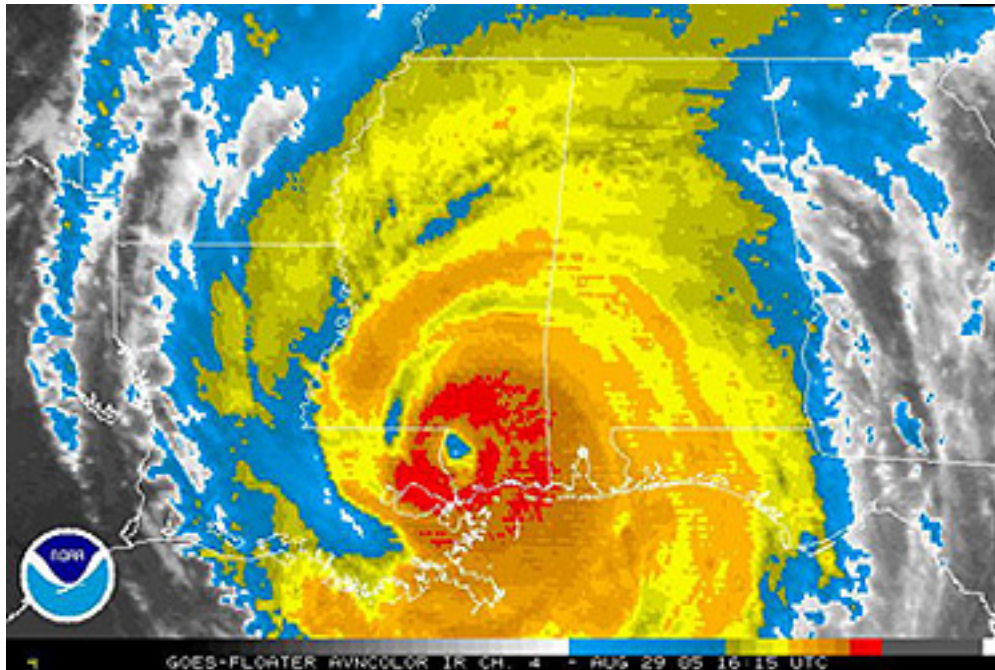


Figure 9. NOAA radar picture of Katrina at Category 3 strength
(from NOAA website)

However, many residents did not evacuate because there was not an evacuation plan that would accommodate all residents regardless of their socioeconomic or disability status. For instance, impoverished and elderly people found it difficult to evacuate and were left with no choice but to remain behind in New Orleans. When the storm hit, many people sought refuge on their rooftops or attics. The storm surged as high as nine meters in certain locations. Thus, the levees and drainage canals could not sustain waters, resulting in at least 80 percent of the city being underwater at some point once Hurricane Katrina surfaced.

Not only was the event disastrous, but also in terms of contingency contracting as well as immediate and long-term response, Hurricane Katrina proved devastating. Although the hurricane was a natural disaster that could not be planned for in its entirety, the preemptive measures on behalf of government and response teams as well as the response endeavors lacked effectiveness, leading to consequences not previously seen with any disaster in the United States. In fact, levee breaches, as illustrated in Figure 10, led to massive flooding, and many people charged that the federal government was slow

to meet the needs of the people affected by the storm. Damage affected hundreds of thousands of individuals in the states of Alabama, Mississippi, and Louisiana. In many cases, people lost their homes and belongings and were forced to relocate away from the Gulf Coast. Additionally, the monetary estimate of damages regarding Hurricane Katrina, according to the U.S. government, stands at around \$100 billion.

In addition to leaving at least five million people without power for an extended period of time, many individuals did not survive Hurricane Katrina. At least 1,200 people died during the event. Prior to Hurricane Katrina, Hurricane Andrew had been one of the most catastrophic events to hit the United States; however, Hurricane Katrina has proven to be one of the most expensive natural disaster in the nation, ultimately due to lack of preparation for the storm.

Fortunately, some of the immediate response efforts were provided through pre-existing contracts that had been previously awarded through full and open competition. “Nevertheless, concerns were raised with respect to how FEMA awarded contracts in Katrina’s immediate aftermath and regarding what contract vehicles were in place before landfall...(regrettably) FEMA was not reporting or tracking procurements undertaken by disaster field office, and the procurement office remains to this day understaffed given the volume and dollar value of its work” (Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina)

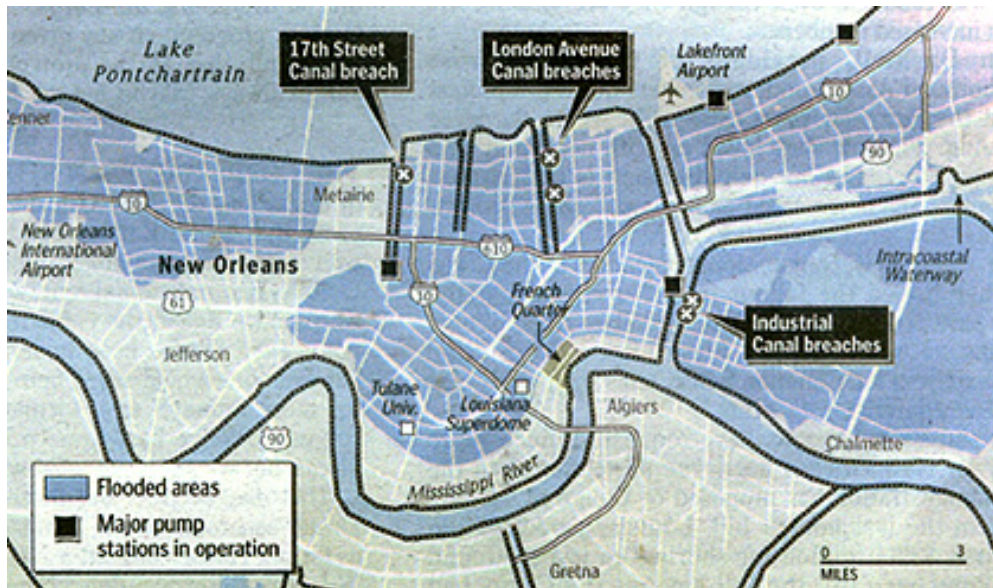


Figure 10. New Orleans levee breaches (Bird of Paradise 5)

C. RESPONSE

Once aware of imminent danger, President Bush took "... the initiative to personally call Governor Blanco to urge a mandatory evacuation" and "took the unusual step of declaring an emergency in the Gulf States prior to Katrina making landfall" (Senate Committee On Homeland Security And Governmental Affairs, 21). It was obvious that the federal government took the weather service's warnings seriously. "The National Weather Service provided repeated and accurate warnings, but local populations did not fully evacuate—greatly magnifying human suffering in the wake of the storm. Andrew and Katrina both overwhelmed State and local responders, but the federal response to Katrina was greatly improved due to better preparations prior to landfall" (Bush).

Prior to Katrina's arrival FEMA "positioned an unprecedented number of resources in affected areas prior to Katrina's landfall, to include 18 disaster medical teams, medical supplies and equipment, and nine urban search and rescue task forces," and by September 1st (only 72 hours after landfall) had deployed nearly 1,800 personnel to save lives and render medical assistance" (Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina 5). The federal government issued

disaster declarations blanketing 90,000 square miles of the U.S. In terms of immediate response, local, state, and federal response was needed.

Fortunately, many Gulf Coast residents that were able evacuated the area prior to Katrina's arrival, even though they had no planned destination; "An exodus of hundreds of thousands left the city, many becoming refugees, finding shelter with nearby relatives or restarting their lives in states as far away as Massachusetts and Utah" (Laforet). Due to early planning, many residents were spared the horror of the aftermath of Katrina and the subsequent flooding of the Gulf region and therefore praised the President for his early planning. Surprisingly, instead of denouncing President Bush and blaming him for their plight, they praised The President and blamed local officials for the city's demise (Baker 3).

Some of the work performed by FEMA was critical to the survival of the Gulf Coast residents. "FEMA staff distributed more than \$5 billion in federal aid to more than 1.7 million households in the affected region by February 1, 2006. FEMA also mobilized elements of the National Disaster Medical System (NDMS), such as Disaster Medical Assistance Teams (DMATs), deploying them to the Gulf States to assist with emergency health care delivery. ...DMAT treated more than 3,000 patients that were able to make it to the medical center, and treated another 2,000 by sending teams of their own personnel out into the surrounding area" (Bush). Since DMAT is a group of professionals supported by their own logistics and admin staff designed to be a rapid response element to supplement local medical care for a period of 72 hours, they were able to provide medical care during the disaster without much intervention or guidance by FEMA or other federal entities (Assistant Secretary for Preparedness and Response)

Forty-one of Louisiana's 64 parishes suffered serious damage and FEMA provided \$4 billion directly to Katrina victims for financial and housing assistance through its Individual and Housing Program, not to mention \$3.1 billion in housing assistance to victims of Katrina and Rita. With over 30,000 people rescued immediately following the hurricane, it can be surprising to hear claims that the federal response was not as proactive as some hoped. Statements like the ones reported in 2006 interview with House Republicans proved the displeasure of even those within the federal government.

They suggested that “the federal government’s “blinding lack of situational awareness and disjointed decision making needlessly compounded and prolonged Katrina’s horror” (Frick).

Within hours of Katrina reaching landfall, the DHS’s Chief Procurement Officer asked the DHS Inspector General’s (IG) Office to begin overseeing the acquisition process in an effort to reduce the number of future contract disputes with vendors working on Katrina relief with the government. The DHS IG assigned 60 auditors, investigators, and inspectors and planned to hire thirty additional oversight personnel. The goal was to have the IG’s staff to review the award and administration of all major contracts, including those awarded in the initial efforts and monitor all contracting activities as the government developed its requirements and as the selection and award process continued.

On August 19th 2005, “the Secretary of Defense approved a standing order to prepare and organize for severe weather disaster operations. This order expedited the pre-positioning of senior military representatives known as Defense Coordinating Officers, to act as liaisons with other governmental organizations in the projected disaster area prior to an event.” The order allowed state and federal entities to utilize DOD installations as logistical staging areas for FEMA. The DOD provided logistics support to FEMA, helping the Agency to track logistics assets while in transit (Bush).

There were other notable contributions by federal entities that should be praised and recognized:

- The DOD and National Guard specifically assisted with search and rescue efforts, and in addition assisted with the evacuation of Gulf Coast citizens following the flooding.
- The Centers for Disease Control and Prevention deployed approximately 200 people to the Gulf Coast to assist with medical treatment for the displaced.
- The National Geospatial-Intelligence Agency, provided reports on the infrastructure within the area, to include airports, hospitals, police stations, emergency operations centers, highways, and schools. They provided the first comprehensive overview of the damage from Katrina. They addressed recovery planning and operations, transportation infrastructure, critical and catastrophic damage, dike stability and breaches, industry damage,

and hazard spills. The imagery activities of NGA were essential to the restoration of critical infrastructure.

- The Department of Transportation (DOT) successfully coordinated one of the largest airlifts in its history to support the emergency evacuation of more than 66,000 citizens from New Orleans. The Air Transport Association also coordinated forty domestic flights with continual DOD and civilian flights to evacuate a total of 24,000 people.
- Prior to Katrina making landfall, the Food and Nutrition Service (FNS) had proactively pre-positioned food in warehouses in Louisiana and Texas, making the food readily available for disaster meal service programs. The Animal and Plant Health Inspection Service (APHIS) sent fifty veterinarians and wildlife experts to the region to rescue animals—pets, zoo animals, and livestock. They augmented and provided veterinary services in Louisiana and Mississippi, saving more than 10,000 animals from the flooding of New Orleans. APHIS helped many animals survive until they could be reunited with their owners, reduce the economic impact of further agricultural losses, and maintain research continuity.

In addition to the federal assistance offered, less publicized assistance came from states that were not affected by the super storm. Other states within the union provided invaluable assistance to Gulf Coast States that would have otherwise declined into complete and utter lawlessness chaos. For instance, The Fire Department of New York City (FDNY) and the New York City Police Department (NYPD) deployed staff and equipment to assist in the recovery effort. “FDNY sent over 660 fire department staff ...to assist the crippled New Orleans Fire Department. NYPD sent more than 300 officers to support the effort to restore order.” Additionally, the State of New York sent more than 100 officers and the Department of Corrections sent more than 250 officers in an effort to help the Gulf States regain control of their respective cities. New York City’s Urban Search and Rescue Team, which is made up of NYPD, FDNY, and Office of Emergency Management personnel, was deployed to Mississippi at FEMA’s request to support rescue efforts along the Gulf Coast. “Fire trucks, police cruisers, school buses, transit buses, and other equipment and goods, bearing the seal of the State or City of New York were abundant during the response” (Bush).

Perhaps most important to the recovery effort, the U.S. Army Corps of Engineers “led the removal of 224 billion gallons of water from New Orleans in 43 days, enabling recovery and repair operations. By improving their pumping capacity and efficiency,

adding pumps, creating intentional breaches, and developing other on-the-spot workarounds, they were able to reduce the estimated time to clear New Orleans of water by approximately 50 percent” (Bush).

In an interview with Ali Frick, President Bush stated that “...things [could] have been done better” but denied any problem with the federal response to the disaster, insisting... “Don’t tell me the federal response was slow!” (Frick).

D. CONTINGENCY CONTRACTING SUPPORT

Within four days of Katrina’s landfall on Monday, Aug. 29, 2005, then-President George W. Bush signed a \$10.4 billion aid package and ordered 7,200 National Guard troops to the region. A few days later, he requested—and Congress approved—an additional \$51.8 billion in aid, yet most of the funding seemed to vanish into thin air (Robillard). Even with all of the aid provided by individuals, states, and the federal government, the response to Hurricane Katrina failed due to a lack of command structure for the overall response effort, a lack of pre-negotiated contracting efforts, and a lack of training for contracting officers and contracting officer’s representatives. While training simulations like the Hurricane Pam Exercise were conducted, the lessons learned during the exercise were incomplete and ultimately ignored by those that should have used the exercise for information and insight as to what could have been pre-positioned prior to an actual disaster. Individuals that should have been involved in the simulation were not required to participate, nor were lessons learned shared with neighboring states or DOD. Such failures resulted in New Orleans residents being effectively stranded by the government, as illustrated in Figure 11.



Figure 11. Stranded citizens of New Orleans at the Superdome (from AFP website)

Before Katrina struck, FEMA had only one contract in place relevant to the Katrina response for temporary housing. According to former FEMA director Mike Brown, ‘the agency in some cases had to buy goods and services “off the street” to meet demand because of inadequate pre-established contracts.’ The most tragic consequence of inadequate pre-established contingency contracts involved the removal of deceased victims from the devastated areas. Squabbling between the state and federal governments prevented recovery of the deceased. “Federal officials maintained that body recovery was ultimately a state responsibility with the federal government providing support only. After much finger-pointing between FEMA and Louisiana officials, on September 13, 2005, Governor Blanco directed the Louisiana Department of Health and Hospitals to sign a written contract to retrieve and transport the bodies of the deceased” (Amey).

Disappointingly, in instances when the government was in a position to use pre-negotiated contracts, it failed to do so! GSA Schedules offer government buyers goods and services at pre-negotiated rates from approved vendors. “...one company on the GSA Schedule (was pre-contracted) to lease cars, SUVs, and light trucks could have provided FEMA with vehicles for under \$600/month, FEMA instead paid Enterprise Rent-A-Car to lease 18 vehicles at the annual price of \$11,232 a vehicle (\$936/month)” (Amey).

It has been concluded that no contingency plan existed in regard to policing or crowd control. Therefore, there was no order after the Hurricane had passed. Many local police officers were preoccupied with their own families and welfare, and others attempted to help their own families as well as citizens simultaneously. In some cases, the stress and mismanagement weighed heavily on local police forces, and many officers took their own lives out of desperation (Block and Cooper 156).

Ultimately, “the lack of planning and pre-landfall contracts caused federal agencies to hustle to locate vendors, to shy away from aggressive negotiations, to enter into no-bid contracts, to use inappropriate contract types, and to pay higher prices in an effort to buy goods and services quickly. In other words, the victims and the taxpayers were not protected by normal market forces that prevent bad deals, and control waste, fraud, and abuse in government spending” (Amey).

The only agency that appears to have prepared and created contingency contracts was the U.S. Army Corps of Engineers. They “...pre-awarded competitively bid contracts for all of these functions to allow quick deployment of resources prior to and immediately after an event. These pre-awarded contracts are part of USACE’s Advanced Contracting Initiative (ACI), which has been in place for about six years” (Amey). The GAO’s 2004 report on contingency planning found that few contingency documents adequately described federal agencies’ delegations of authority. In some cases, inadequate planning —especially for temporary housing—led to hundreds of millions of dollars of waste in recovery efforts.

Hurricane Katrina demonstrated the importance of contingency contracting as an effort to mitigate natural or societal disasters. As the recovery effort continued in New Orleans, changes were already being made to the way in which the federal government responded to disaster. Unfortunately, due to lack of pre-planning, contracting officers on-site were forced to learn contingency contracting process, as outlined in Figure 6, while in the field meeting immediate needs of the Louisiana residents. In addition to better outlining command and control, communications and preparation, contracting took center stage. It was demonstrated time and again during Katrina that civilian companies were

better equipped to handle short-fused needs and that they had learned their lessons four years prior during 9–11.

E. FUNDING

As summarized by Scott H Amey in his online article *Federal Contracting: Lessons Learned from Hurricane Katrina*:

to prevent abuse, the government should enter into pre-established contingency contracts, and ensure that certain contract types that have a greater propensity for abuse (including performance-based contracts, interagency contracts, time and material contracts, and purchase card transactions) are used only in limited circumstances and are accompanied by audit and oversight controls. (20)

Once the nation had time to reflect and study the response to Hurricane Katrina, it was evident that the government was not prepared to handle disasters of such magnitude. A Category 5 hurricane combined with breeched levees had been predicted during the Pam exercise, but seemed too far-fetched for anyone to really believe the situation to be plausible. Unfortunately for Gulf Coast residents, the impossible became reality and they were left to suffer in the aftermath. “Chief among the issues raised were the dearth of advance (or pre-existing) contracts; the federal government’s use of noncompetitive contracts; the proliferation of subcontracting tiers to five or six levels; and the concern that, despite a Stafford Act requirement that a preference be given to local firms for disaster recovery activities following an emergency or disaster, local companies were largely overlooked in Hurricane Katrina contracting. Legislation enacted by the 109th Congress addressed these procurement issues” (Bea et al. 56). The lack of pre-placed contracts led to supplemental funding requirements, as illustrated in Figure 12.

Supplemental Appropriations Related to the 2005 Gulf Coast Hurricanes, by Agency or Department, as of July 2007

(Billions of dollars)

	Appropriations ^a
Federal Emergency Management Agency, Disaster Relief Fund	45.3
Department of Housing and Urban Development, Community Development Block Grants	16.7
Department of Defense	9.4
Army Corps of Engineers	8.4
Department of Transportation	4.4
Department of Education	2.0
Small Business Administration	1.6
Federal Emergency Management Agency, Community Disaster Loans	1.3
Department of Veterans Affairs	1.2
Department of Agriculture	1.0
Other Department of Homeland Security	0.8
Department of Health and Human Services	0.7
Other Agencies	2.1
Total	94.8

Source: Congressional Budget Office.

Figure 12. Hurricane Katrina, supplemental appropriations (from Long 7)

The Federal Stafford Act served as a disaster assistance funding alternative for Hurricane Katrina's damages. The Stafford Act fulfills a number of purposes. The funding from the act is dedicated to preparedness, emergency response, recovery, and hazard mitigation. Regrettably, it has been reported that the federal government did not waive the Stafford Act, which requires localities to contribute 10 percent of the cost of reconstruction and clean-up projects, until May 2006. Laws enacted by the 109th Congress amend the Stafford Act by clarifying some sections, waiving some previous requirements, and creation of new authorities. The changes to the act reflect lessons learned after Hurricane Katrina and the belief of a need for legal remedies to make Stafford Act programs more flexible and responsive to events of a catastrophic nature.

Another channel of funding came from FEMA, which purchased over 25,000 transitional homes and 27,000 travel trailers for over \$900 million (Block and Cooper 133). However, this funding was also unsustainable. Block and Cooper suggest that

FEMA should have developed a contract mechanism defining the responsibilities of each role as well as the deliverables and expectations for contractors. Because it did not do that, FEMA's decisions led to wasting valuable funding.

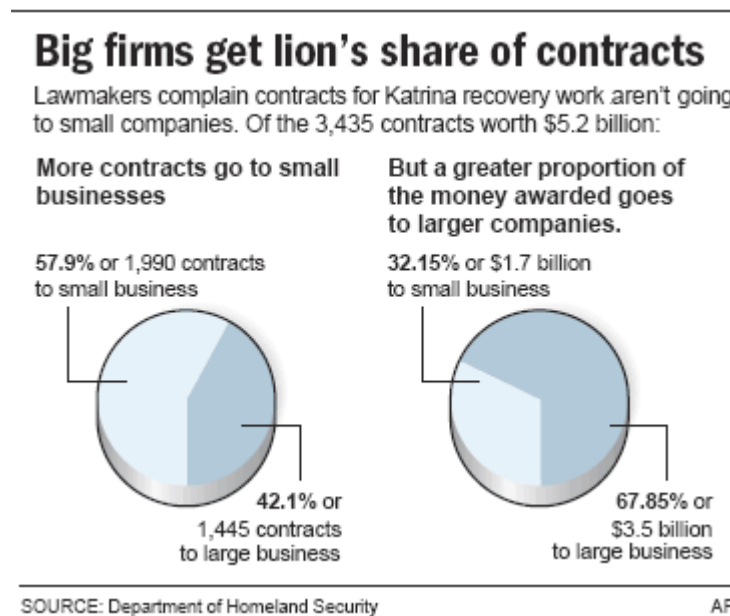


Figure 13. Small versus big business contracts (from The Associated Press)

F. ANALYSIS OF RESPONSE AND CONTINGENCY CONTRACTING

A deficit in communication proved to be most detrimental to first-response efforts of Hurricane Katrina. Because effective communication was absent, response and recovery efforts could not occur as previously planned. As a result of local, state, and federal first responders not being able to communicate with one another as well as the public effectively, there were extended delays in coordinating organizations for relief as well as offering provisions and refuge for individuals severely impacted by the catastrophic storm. According to Cooper and Block, “Long delays in response can be directly attributed to the inability of officials to communicate with one another as well as those officials above them who were in positions to help” (247). Communication was disabled in New Orleans from August 28, 2005 to August 31, 2005—approximately four days after the disaster occurred. Once the phone systems had been corrupted or compromised, there was no alternative communication method for first responders to

reach second responders. It was not until one first responder was able to access his personal Internet phone account and could reach outside of the city for the first time after four days. Following Katrina, command and control plans served to outline several important aspects of response, including chains of command, the roles of each commander, backup commanders in the event that first line of command cannot fulfill their roles, and the limitations to their roles.

Once communication was restored, a component of first response was the community itself. Ordinary citizens commandeered boats and offered food and shelter until second-level response teams could reach the city. However, it has been stated that first response did not fulfill its role effectively, which means that second wave of responders fulfilled the role of first response, only much too late.

As communication became fluid between the city and federal response teams, the nation acted heroically to help individuals impacted by Hurricane Katrina as well as the City of New Orleans and surrounding Gulf Coast areas. Help was offered not only by other cities and states, but other nations that had experience dealing with such catastrophic events.

Although many individuals and organizations rose to the challenge of providing help for victims of Hurricane Katrina as well as the City of New Orleans, the federal government demonstrated that it was not prepared to handle a disaster at the magnitude of Hurricane Katrina. The failure illustrates that contingency planning was not adequate on the federal level as well as on the local and state levels. For instance, days had passed since the hurricane hit when FEMA was able to establish operations in New Orleans. Even after FEMA had arrived, no unified plan of action had been created or was ready for execution until over a week later. Due to a lack of pre-planning, recovery took longer and cost more than it should have.

The role of FEMA as a major disaster response organization in the United States is to ensure that disaster mitigation programs are developed and plans for disasters are coordinated. However, the acting capacity of FEMA in this disaster was overreached because of the lack of response and organization from other local, state, and federal

response teams. As a result, FEMA was unable to perform as expected. Even as FEMA representatives in New Orleans plead for more resources from FEMA representatives in the capitol, the agency was having a hard time predicting when supplies would arrive and where they were in transit (Block and Cooper 124).

Albeit not an all-inclusive list, other findings of failure are listed below:

- 1. Due to a lack of communication between personnel within FEMA, FEMA's operations leader in Louisiana was apparently unaware of his own agency's assessment that the area was too flooded for the Mobile Emergency Response Support (MERS) communications trucks to get to the Superdome! (Block and Cooper 141). Not only was there no communication between state representatives and FEMA, those representing FEMA in DC and Louisiana could not agree on how to resolve the problems faced by survivors of Katrina. Once FEMA appeared to try to gain control of the situation, they quickly gained a reputation as "a stovepipe into which intelligence disappeared and rarely reemerged"(Block and Cooper). It was later discovered that not only did the local FEMA representatives fail to share information with local authorities; they failed to provide information back to their superiors in Washington, DC thereby preventing the President from obtaining the much-needed information to make quick responsible decisions.
- 2. In Baton Rouge late Tuesday afternoon, Louisiana's Jeff Smith, who had earlier been told that 500 buses were coming, received the paperwork that would formalize the request. As he looked over the documents, he saw that the number of requested buses had dropped to 455. "I was told that someone at FEMA headquarters had 'done the math' and it was determined that we didn't need 500 buses" (Block and Cooper 143). And again later, when buses were ordered by FEMA to evacuate people from the Superdome and other areas of the disaster, the original request was not honored, but changed based upon someone's uninformed opinion. The long-awaited contracts, based on requests the state had made several days before, were starting to kick in. The U.S. Department of Transportation had finally delivered a full complement of 1,100 buses, and many hundreds were already lined up in city streets. In addition, Transportation had also begun moving the first commercial aircraft into the New Orleans airport, to whisk evacuees out of the ruined city (Block and Cooper 143). Ultimately, those that were on site were not being trusted or empowered to do their jobs nor were they effectively communicating with those in DC. Due to a misconceived belief that FEMA was attempting to relieve state and local authorities of their power, those in state government made FEMA's job more difficult.

- 3. Another request that was scrutinized in Washington and ultimately ignored was the request for ambulances. The request was sent to Washington, where it was scrutinized (and modified) by a FEMA analyst. Then it was shipped back down to Baton Rouge that evening so it could be reviewed by those on site in New Orleans. Following the review, the request then went back to Washington, where after several hours, it was transmitted to the U.S. Department of Transportation's overnight desk along with a request for three hundred ambulances. The ambulance request was later canceled because the Department of Transportation, in the words of one FEMA official, "doesn't do ambulances." And it was only then that bus contractors, some located thousands of miles from New Orleans, were given the word to roll. All of these machinations were largely unknown (Block and Cooper 151). Emergency Support Functions in place prior to Hurricane Katrina were unable to operate effectively because coordination was not adequately planned and bureaucracy prevented expedient decision making. Because of this reality, leadership and organizational changes needed to occur to ensure that decisions in an emergency situation can be made to eradicate issues regarding the disaster.
- 4. Regrettably, the preexisting contracts that were in place prior to Katrina turned out to be more of a hindrance than help. FEMA had detailed unyielding regulations that governed all procurements, as there were long-standing contracts in place to handle emergency supplies—deals that had been signed long before the storm. Due to the fact that the pre-existing contracted supplies would not arrive in the time required by rescuers, a FEMA representative decided to procure necessities through another avenue. When one FEMA employee practiced a little 'contingency contracting' of his own by procuring supplies from Wal-Mart, a day after his deal, a team of lawyers arrived at his office to take a statement. They told him they might pursue legal action against him for signing off on the Wal-Mart deal. Infuriated by the intrusion and by the insinuation, the employee settled in at his computer and silently typed out a three-line statement. "I did it," the statement said. "I would do it again. The president would agree with it." He signed the statement and handed it to the department's general counsel, then he sat back down at his desk and turned away (Block and Cooper 215).
- 5. A key example of pre-planning not being adequate was the decision to relocate individuals to the Superdome in New Orleans. The idea was to get thousands of people into the Superdome, where they could seek shelter, food, and safety. However, the Superdome's supplies could not sustain the individuals who had sought refuge there. Therefore, people were starving and thirsty, had no place to sleep, and were victims of crimes while in the Superdome because ample police officers were not stationed at the site. Because of this reality, future contingency planning on behalf of police

officers, emergency personnel, and first responders must also integrate adequate training and psychological counseling.

- 6. There were several factors that were not addressed immediately that resulted in the event being known as one of the worst response efforts to a natural disaster of all time, including not knowing how much food and water was needed to ensure that people did not experience further loss and devastation. Because of misrepresentations to the public as well as a deficit in resources, affected people began to panic, resulting in desperation and criminal activity. Subsequently, police and public service personnel could not match the amount of people in the general public who were lashing out. Following the disaster, residents that had evacuated were not able to return home to gather belongings or protect family heirlooms from looters. A further frustration to residents, there was no information provided by emergency responders on the future of the city. Thousands of people were left without food, water, power or shelter for days! As one resident of the 9th ward illustrated, following the storm residence in some areas were uncertain of the futures. “Looking out on the block, (Carolyn Parker) ticks off the status of each house. The one to her north, “the landlord has.” And the one to the south, “I find out this couple’s not coming back, so that’s probably up for sale. The next house right behind it, I don’t know if he’s coming back. ‘Cause that’s a senior citizen” (Wolff).
- 7. Lack of transportation and a well identified and publicized method of organized evacuation was another disappointing characteristic of Hurricane Katrina response. When individuals attempted to flee the city using the bridges, they were forced to return to the city while being held at gunpoint. Additionally, transportation in and out of the city as well as within the city was practically impossible.
- 8. A major source of frustration to family members looking for loved ones following the storm, inaccurate reports of survivors and decedents was released. For instance, in the case of the woman listed in number 6 above, “...After authorities found no trace of Parker for weeks, (so) the local newspaper pronounced her dead. But Parker had survived. She had been one of the last people to leave her neighborhood under mandatory evacuation and was one of thousands of other newly homeless victims of the storm” (Wolff). Contrary to the newspaper’s report, Parker was alive and was one of the first people to move back into her neighborhood. She lived in a FEMA trailer for 4 years, during which she advocated for the rebuilding of St David Catholic Church, the only Catholic Church that welcomed blacks when she was growing up.

The entire episode cut to the heart of the major problems facing FEMA: As a part of the Department of Homeland Security, it had no real authority from the ground of a disaster, and it was unable to effectively communicate with federal, state, or private

industry. Most important, the poor oversight in the award and monitoring stages of contracting was the most recurrent and significant problem in the federal government's response to Hurricane Katrina. "According to one Department of Homeland Security official, FEMA was authorized to hire approximately 60 contracting officers before Hurricane Katrina hit U.S. land—some government reports have stated that 172 acquisition officials were needed. The agency, however, was severely understaffed—with only 36 contracting officers on staff" (Amey).

Not as evident but just as damaging as the lack of personnel, the lack of institutional memory significantly hampered the recovery effort. Many government reports attributed the lack of oversight to the frequent rotation of officials in and out of the areas, and other acquisition officials being "borrowed" from other agencies. All too often, there was no overlap in the rotation, allowing valuable institutional memory and scenario-specific information to be lost.

As a result of inadequate contracting staff, mistakes were multiplied, some of which have been detected by post-award audits. Members of the House Government Reform Committee found that mileage claims were overstated and duplicate bills were submitted for debris removal and other services. One of the most costly mistakes was an alleged computation error missed by FEMA officials that would have resulted in Bechtel double-billing the federal government \$48 million, if it had not been found by the Defense Contract Audit Agency. These mistakes were only caught because of the tremendous emphasis on after-the-fact review. They might never have been made had the necessary oversight of government contracts been in place during the duration of the contract (Amey).

Poor contract oversight is exacerbated by the lack of communication among agencies that delegated acquisition functions. For instance, FEMA tasked GSA to write three contracts in Louisiana for base camps, hotel rooms, and ambulances, worth over \$120 million. GSA contracting officers awarded the contracts, but FEMA did not perform its oversight mission and the FEMA officials listed as the points of contact had no knowledge of the contracts. The GAO reported that "only after contacting multiple FEMA officials over a 3-week period were we able to determine the agency officials

responsible for contract oversight” (Amey). For instance, the so-called blue roof program was a scheme to provide temporary waterproofing of damaged structures by wrapping roofs in a sheet of blue plastic. It was costing some \$3,000 per structure, though the actual price paid to the laborers performing the task was a fraction of the amount. The rest was going to middlemen—beneficiaries of massive no-bid contracts that FEMA had allotted to a handful of national companies, which in turn hired smaller firms to do the work. “Needless bureaucratic churning” was how Secretary Chertoff characterized the rich contracts, and he and top FEMA officials promised to rebid the work along more equitable lines. But months passed, and the contracts remained in place (Block and Cooper 273).

Upon review, it was discovered that a great failure of FEMA’s previous disaster plans did not have enough detail, precisely because they were developed by people in government that have never lived in the Gulf region nor have they been first responders. Therefore, the planners did not fully comprehend what first responders would need to assist those in peril nor did they seek out those individuals that could provide the detailed required to create a reasonable recovery plan (Block and Cooper 287).

Unfortunately, many of the problems FEMA and other responders suffered from were lack of preparedness for the extreme nature of the event and a lack of funding pre-positioned for their needs. In the absence of the pre-positioned contracts or standing orders like the DOD possessed, FEMA expected that the bureaucratic ‘red tape’ would be eliminated to help them help residents of the Gulf Coast during their time of need. Unfortunately, that was not the case. There were long periods of time where FEMA personnel on site had to wait for contract approval. For instance, it took over a week for the U.S. Department of Transportation to finally deliver a full complement of 1,100 buses to New Orleans to evacuate survivors. In addition, it took over a week for transportation to begin moving the first commercial aircraft into the New Orleans airport, to whisk evacuees out of the ruined city (Block and Cooper 299). In addition to long-lead times, contracting officers proved that, while under pressure and forced to make quick purchasing decisions, due to inability to allow companies to compete, many contracts went to larger companies with well-known track records. Had communication been better

and contingency contracting better utilized, the wait time for relief could have been cut in half if not virtually eliminated.

Another major disappointment regarding funding and spending was the fraudulent activity that occurred in Hurricane Katrina disaster relief investing. The oversight in federal spending resulted in penalties, including 239 arrests, nearly 200 indictments, and at least 80 convictions. According to Block and Cooper, “The majority of the indictments, arrests, and convictions have been against individuals who defrauded the government in petty crimes, rather than contractors caught exploiting the system on a large scale.”

G. LESSONS LEARNED AND RECOMMENDATIONS

Planning for future disasters similar to Hurricane Katrina immediately began after the event. “Considering hurricane season has a defined timeframe and these storms provide sufficient warnings in advance, there are plenty of opportunities to plan and preposition the logistical necessities required in the locations potentially impacted by hurricanes” (Block and Cooper). Therefore, there are a number of structural phases that cities in the United States should understand prior to dealing with natural disasters that inevitably occur. For instance, food, water, blankets, bedding, and shelter should be strategically organized in a manner that is structured, sustainable, and easily maintained. The purpose of these strategic locations is for bolstered mobility and sustainable accommodations.

As evidenced throughout this report, it is clear that many challenges existed both in terms of the disaster itself and the response efforts that followed Hurricane Katrina. The largest and most significant challenge is the fact that there was lack of preparation for this event. Furthermore, the division of responsibilities assigned to organizations to ensure the effectiveness of the levees in New Orleans was faulty. This challenge included the fact that there were too many different organizations working on one aspect of the preparation, and unfortunately, each organization had a different goal, which prevented the cooperation and coordination of preparing for this disaster effectively. As illustrated

in Table 5, the costs associated with responding to and rebuilding after Hurricane Katrina were superfluous and some were possibly avoidable.

*Project Information Report for Orleans East Bank – Revision #01
Lake Pontchartrain, LA., and Vicinity Hurricane Project
January 2006*

area, a 30 percent contingency is being used for contracts not yet awarded. The need for this is evidenced by bids received on awarded contracts generally exceeding construction estimates and it is anticipated that there will be a higher than normal percentage of contract modifications. The contingency for awarded contracts is 10 percent.

Table 14 - Summary of Orleans East Bank Cost Estimates	
Reach	Total Cost
Table L-1 - Phase I Floodwall Repairs - 17 St. Canal (OEB01)*	\$6,198,000
Table L-2 - Phase II Floodwall Repairs - 17 St. Canal (OEB02)	\$11,175,000
Table L-3 - Phase I Floodwall Repairs - London Ave Canal at Mirabeau Ave (OEB03)*	\$4,161,000
Table L-4 - Phase II Floodwall Repairs - London Ave Canal at Mirabeau Ave (OEB04)	\$9,154,000
Table L-5 - Phase I Floodwall Repairs - London Ave Canal at Robert E. Lee Blvd (OEB05)*	\$5,897,000
Table L-6 - Phase II Floodwall Repairs - London Ave Canal at Robert E. Lee Blvd (OEB06)	\$12,093,000
Table L-7 - Floodwall Repairs - London Ave Canal East Side at Robert E. Lee Blvd (OEB08)	\$4,564,000
Table L-8 - IHNC West Side Floodwall Repairs - Hwy 90 To Lake (IHNC04)*	\$7,653,000
Table L-9 - IHNC West Side Floodwall and Minor Scour Repairs - Hwy 90 to IHNC Lock (IHNC08 & IHNC09)	\$4,993,000
Table L-10 - IHNC West Side Floodwall Repairs - France Rd to Benefit Rd (IHNC02)*	\$4,836,000
Table L-11 - IHNC West Side Floodwall Repairs - France Rd to IHNC (IHNC05)*	\$5,060,000
Table L-12 - Orleans Ave Canal - Channel Scour and Slope Pavement Repairs (OEB07)	\$410,000
Table L-13 - Lakefront Levee Scour and Floodwall Repairs (OEB07)	\$38,000
Table L-14 - Closure Structure at 17th Street Canal (OEB09)	\$27,034,000
Table L-15 - Closure Structure at London Avenue Canal (OEB10)	\$23,846,000
Table L-16 - Closure Structure at Orleans Avenue Canal (OEB11)	\$23,846,000
Table L-17 - Bank Stabilization for 17th Street Canal (OEB12)	\$6,642,000
Table L-18 - Bank Stabilization for London Avenue Canal (OEB13)	\$17,869,000
Table L-19 - Bank Stabilization on Orleans Canal (OEB14)	\$4,695,000
Subtotal	\$180,164,000
Contingency (Awarded Contracts = 10%)	\$3,380,500
Contingency (Unawarded Contracts = 30%)	\$43,907,700
Demolition of Interim Gates and Temporary Pumps	\$19,000,000
Temporary Pumps	\$20,644,311
Subtotal	\$267,096,511
Engineering and Design (E&D = 10%)	\$26,709,651
Supervision and Administration (S&A = 10%)	\$26,709,651
LERRDs: 17th Street Canal - \$1,400,000; London Avenue Canal @ Mirabeau Avenue - \$1,650,000; London Avenue Canal @ Robert E. Lee Boulevard - \$3,400,000; 17th Street Canal Closure Structure - \$2,500,000	\$8,950,000
Operation and Maintenance of interim closures and temporary pumps (\$1.45M/ year for 3 years)	\$4,350,000
Total	\$333,815,813

NOTE: * indicates an awarded contract

Table 5. New Orleans levee repairs costs
(from Vicinity Hurricane Project 14)

To help prevent future abuses of contingency contracting capabilities, the Post-Katrina Act required the Secretary of Homeland Security to draft regulations to limit to 150 days the duration of any noncompetitive contract that is needed to meet an urgent and compelling need, that is in an amount greater than the simplified acquisition threshold, and that facilitates response to or recovery from a natural or man-made disaster or a terrorist incident. P.L. 109–295, § 695. However, to prevent abuse, the Administrator must submit a report to congress for every contract obtained using noncompetitive contracts.

As part of the continuing effort to oversee the expenditure of federal funds in the Gulf Coast, the Inspector General (IG) for DHS has created an in-house position of assistant inspector general specializing in the Hurricane Katrina recovery effort. In addition, the Department of Justice has established a Hurricane Katrina Contract Task Force, which includes relevant offices of inspector general, to coordinate investigations and audits in this matter. The prevention of fraud, waste, and abuse in the Gulf Coast recovery effort remains a major congressional concern.

Among the duties of the Administrator of FEMA, it has been discovered that the Administrator is required to prepare and submit to Congress annual catastrophic resource reports. These reports must, among other matters, identify the resources needed to undertake planning, training, regional office enhancement, surge capacity, logistics, state and local preparedness, and responsiveness to the National Response Plan.

Communications proved to be a major challenge during the aftermath of Katrina. Poor communication between Washington and people “on the ground” exacerbated problems, even when they were all working for the same agency. For example, against the advice of FEMA officials in Alabama, FEMA Headquarters paid a federal contractor \$10 million to renovate 160 rooms and furnish another 80 rooms in military barracks. As local FEMA officials had projected, the facility largely went unused. In fact, only six occupants were living at the facility when FEMA officials decided to shut it down (Amey).

Another component of organization and leadership that resulted from Hurricane Katrina response efforts is the Secretary of Defense is in charge of directing the Chief of the National Guard Bureau to furnish a list of capabilities of the National Guard. This list may include statewide mutual assistance agreements and the potential organizations that can enter contingency contracts to provide services in the events of a natural disaster of Hurricane Katrina's magnitude. "In addition, the Secretary of Defense should direct the Chief of the National Guard Bureau to make this information available to the Northern Command, U.S. Joint Forces Command, and other organizations with federal military support to civil authority planning responsibilities." Prior to Hurricane Katrina, the Department of Defense was not allowed to activate reserve units for catastrophic disaster relief involuntarily. However, Congress has considered removing this statutory restriction for the purpose of enhancing mobility in the event of a CONUS disaster in the future.

Additionally, a Joint Capabilities Database was established after Hurricane Katrina by both the National Guard Bureau and the states involved in the disaster. The Joint Capabilities Database consists of inventory of capabilities and the agencies that can respond to certain aspects of the potential disasters. Other contingency agreements include the National Emergency Management Agency agreement that allows emergency situation information to be dispersed to all states within the United States, the National Guard tracking system to ensure that all facets of the disaster are not overlooked, and the Emergency Management Assistance Compact (EMAC) agreements, which ensures that communication is fluid among the NGB, the NEMA, and the United States Northern Command (NORTHCOM) (Block and Cooper).

Due to the significantly flawed response to Katrina, contingency contracting plans are now charged with possessing specific characteristics to ensure their effectiveness. Every plan must be feasible and actionable and concern many elements of disaster response, including resources, shelters, rebuilding methods, communication strategies, integration of local facilities and communities, and both state and federal government response (Block and Cooper 306).

During this reform period, the need for better education for government personnel was identified, but it still took years for all government entities to take action. As early as

2003, The Naval Postgraduate School MBA Program sponsored an MBA Professional Report specifically covering Marine Corps Contingency Contracting Marine Corps Institute (MCI). The report, by Kenneth A Burger, Jonathan R Kehr, and Brian E Wobensmith focused on the development and publishing of a Contingency Contracting MCI to assist the Marine Corps in training its contract personnel in preparation for deployment to a contingency operation. Surprisingly, as recent as 2003, there was no requirement for the contracting specialist to attend a formal school prior to supporting a contingency operation!

The purpose of their MBA Project was “to develop and publish a Contingency Contracting MCI to assist the Marine Corps in training its contract personnel in preparation for deployment to a contingency operation,” as there was no requirement for the contracting specialist to attend a formal school prior to supporting a contingency operation. ...The Contingency Contracting MCI will aid the contracting personnel with the training needed to be successful in a contingency environment and efficiently and effectively support Marine Corps units abroad.” This project was sponsored by Headquarters Marine Corps, Installation & Logistics, Logistics Branch in conjunction with the Marine Corps Institute (MCI). A draft Contingency Contracting MCI is included in the report.”

Within just two short years of the MBA report, Hurricane Katrina struck New Orleans, and virtually the same shortcomings were identified by the Gansler Report. The Gansler Commission, convened in 2007, was “an independent commission led by Dr. Jacques Gansler, the former Under Secretary of Defense of Acquisition, Technology and Logistics, pointed to systemic problems in the Army’s contracting system. According to a 2007 release from the Army, the report found that there were “not enough people, too little training, and an antiquated system” (Lee).

The Gansler report made four recommendations:

- Increase the stature, quantity and career development of contracting personnel
- Restore responsibility to facilitate contracting and contract management

- Provide training and tools for overall contracting activities in expeditionary operations
- Obtain legislative, regulatory, and policy assistance to enable contracting effectiveness in expeditionary operations

Gansler commended the DOD for making some headway in adding more contracting expertise with the announced Defense Acquisition Workforce Development Fund, which seeks to add 10,000 contracting professionals, but later worried that “we’re going to fill 10,000 seats with people without experience” (Mullen). Gansler also cited an upcoming Defense Science Board study to highlight the need to place much greater emphasis on service contracting, as most studies, rules, policies and mindsets are still focused on buying goods, despite the fact that services contracting is very different and comprises half the budget.

DOD’s certification training program—provided by the Defense Acquisition University (DAU)—generally demonstrates the capability to provide effective training, though some attributes of an effective training program are lacking... However, DOD lacks complete information on the skill sets of the current acquisition workforce and does not have outcome-based metrics to assess results achieved in enhancing workforce proficiency and capability through training efforts. (Government Accountability Office)

With a reduction in military force and a 20% reduction of the contracting workforce from 1998 to 2006, while the workload and the number of dollars associated with that workload experienced a five-fold increase, it could have been predicted that the government was heading for a contracting disaster ([H.A.S.C. No. 111–32] (One Hundred Eleventh Congress 83)).

Once the problems were properly identified and brought to the attention of deciding factors, the GAO recommended that the DOD establish milestones for developing metrics to measure how certification training improves acquisition workforce capability and a time frame for acquiring and implementing an integrated information system in order to mitigate losses and to rebuild. DOD concurred with the second but not the first recommendation. GAO continues to believe DOD needs to develop additional metrics.

The Gansler Commission assisted in the establishment of the Contingency Contracting Corps and training for individuals that wish to become members, yet contracting representatives are not afforded protections similar to those that Reservists enjoy due to USC Title 10, and therefore have no incentive to join the corps. There is currently no incentive for contracting officers to become members of the contingency contracting corps, nor any reward for helping to prepare for disasters. “A lack of training for the contracting specialist impedes the mission of the Marines in the battlefield. Fair and reasonable prices may not be achieved due to a lack of competition. This can be caused because the contracting specialists may not understand or be creative enough to locate potential sources to provide supplies and services required by the warfighter in a timely manner. Also, there are different rules, regulations, business practices, and customs that the specialists may not be aware of that can hinder the relations with the local population within the area of the contingency.”

In an effort to resolve issues brought to light by the 2003 MBA Thesis and the Gansler Report, the DOD created the Army Contracting Command. Headquartered at Redstone Arsenal in Alabama, ACC is a two-star command with two subordinate one-star commands—the Expeditionary Contracting Command (for locations outside the continental United States) and the Mission and Installation Contracting Command—and five major contracting centers that provide support to AMC’s life cycle management commands and MSCs. These centers provide contracting support to several program executive offices and program managers supporting the U.S. Army’s major acquisition programs. ACC offers the contracting expertise of some of the best-trained people in the Army, ready to support the war fighter while ensuring responsible stewardship of taxpayers’ funds (Army Contracting Command).

Specifically, the Expeditionary Contracting Command (ECC) (for locations outside the continental United States) and the Mission and Installation Contracting Command (MICC), accomplishes contingency contracting through seven contracting support brigades, eight contingency contracting battalions, and 83 contingency contracting teams throughout the world. In FY 2012, ECC executed more than 47,000 contract actions worth almost \$1.8 billion. In addition, the U.S. Army has specifically

created four contracting support brigades, which provide contract support and contract planning support to Army service component commanders.

Its senior contingency contracting teams each consist of four-people able to provide contracting support at the division and brigade level. By the end of fiscal year 2009, the Army activated 42 teams. “The teams, battalions, and brigades, are modular in nature and can be deployed worldwide in support of military operations. The teams and battalions get their day-to-day contracting training and work experience at our installation and contracting centers located across the Army Contracting Command” ([H.A.S.C. No. 111–32] (One Hundred Eleventh Congress 83)). Members of the ECC have the ability to deploy anywhere in the world on short notice to provide “operational contract support planning, contract policy and oversight, contract execution, contract administration and contractor surveillance in support of deployed forces” (Army Contracting Command). Better yet, when designated as the lead service for contracting, the ECC is ready to establish a joint theater support contracting command to provide contracting guidance and acquisition solutions for their customer! With a professional workforce comprised of 657 military and 686 civilians, the ECC has the corporate knowledge and experience that the federal government should look to learn from and utilize in times of need (Army Contracting Command).

In December 2011, as a member of the Contracting Functional Integrated Planning Team, the Director, Defense Procurement and Acquisition Policy (DPAP) was made responsible for collaboration with the Defense Acquisition University to offer education for all contingency contracting personnel. The Deputy Assistant Secretary of Defense for Program Support (DASD(PS)) was made responsible for oversight and management to enable the orchestration, integration, and synchronization of the preparation and execution of acquisitions for DOD contingency operations. In cooperation with the Joint Staff, Military Departments, and OSD, he serves as the DOD focal point for the community of practice and the community of interest for efforts to improve OCS program management and oversight and is responsible for the development of a programmatic approach for the preparation and execution of orchestrating, integrating, and synchronizing acquisitions for contingency operations (GPO). As the

DOD is routinely called upon to support in-country disasters, it should be noted that the Army has been identified by Congress to lead the contingency contracting ‘charge’ for the DOD and the federal government as a whole.

Technological evolutions in contingency contracting include a synchronized pre-deployment tracker—Enterprise Suite (SPOT -ES), Contingency Acquisition Support Model (cASM), and the three-in-one tool (3in1 Tool). These advancements have allowed contingency contracting to become more efficient.

SPOT-ES was developed by the Department of Defense and has been designated as the joint Web-based database to assist the those individuals on site during an emergency “in maintaining awareness of the nature, extent, and potential risks and capabilities associated with contracted support in support of contingency operations, humanitarian or peacekeeping operations, or military exercises designated by” leadership (Under Secretary of Defense (Acquisition, Logistics, and Technology) (USD(AT&L))).

SPOT:

- Serves as the central repository for up-to-date status and reporting on contingency contractor personnel.
- Tracks contract capability information for all DOD-funded contracts supporting contingency operations, humanitarian or peacekeeping operations, or military exercises designated by the CCDR.
- Provides by-name accountability of DOD-funded contingency contractor personnel and other personnel as directed by USD(AT&L) or by the CCDR.
- Contains minimum contract information necessary to establish and maintain accountability and visibility of contractors and contract capabilities for all contracts awarded to support contingency operations, external and systems support contracts and contracting activities.

Possibly the most important technological advance since Katrina are the cASM & 3in1 Tool. The cASM assists planners in developing requirements for the situation and the 3in1 Tool allows those on site to order, receive and pay for goods and services provided. “The 3in1 tool is a technology-based solution to record and transfer data when conducting on-the-spot, over-the-counter, field purchases of supplies and non-personal services (cash and carry type purchases), which have traditionally been conducted using an SF44. The 3in1 Tool is a small lightweight device that will capture and record

purchase, payment, and receiving information including the user's receipt of goods and vendor acknowledgement of payment. The device will automatically transfer that data to the 3in1 Module in the Joint Contingency Contracting System (JCCS)" (Under Secretary of Defense (Acquisition, Logistics, and Technology) (USD(AT&L))). The cASM is a web-based tool that is simple and is "designed to assist those individuals responsible for initiating contracting requirements in an expeditionary environment. The application will identify the documents required to initiate a contract, provide templates for the documents, prompt the user for the information required to complete the documents, and will route the documents to the appropriate reviewers and approvers" (Under Secretary of Defense (Acquisition, Logistics, and Technology) (USD(AT&L))). cASM will also alert individuals when it is their responsibility to take action on the requirements package. cASM's output will then be a completed, approved contract requirements package for a forward deployed contracting office to take action.

cASM has been designed for the Non-classified Internet Protocol (IP) Router Network (NIPERNet) use so, provided first responders have Internet connectivity, they can access cASM virtually anywhere! By accessing the cASM website at <http://www.tqsapps.com>, government personnel can not only complete training, but will eventually be able to download much needed forms and information.

In an effort to better delineate roles and responsibilities during crisis, yet another technological tool has been developed. One such tool is a virtual experience immersive learning simulation (VEILS) entitled Barda Bridge, which was developed in 2008 by WILL Interactive, INC and the Defense Acquisition University (DAU) (Defense Acquisition University). The program allows the viewer to assign leadership positions as well as the roles of leaders to be defined. It also allows users to assign particular individuals to specific scenario if a disaster occurs. Additionally DAU has developed courses that train government personnel on the importance of contingency contracting. CON 334 is a four-day training session dealing with contingency contracting. However, prerequisites for the course are lengthy: CON 100, CON 121, CON 124, CON 127, CLC 033, and CLC 058. Many military personnel do not have the time, nor do they make the

time to take courses voluntarily and on their off-time. And unfortunately, contracting officers are not required to complete the training at this time.

Many lessons were learned following Katrina some of which came directly from American corporations that assisted in the immediate response and recovery efforts. Wal-Mart delivered truckloads of supplies, including free prescription drugs, to those devastated by Hurricane Katrina almost immediately after the storm passed, rather than in the days—in some cases weeks—that it took government agencies to provide relief. The fundamental reason for such superior performance is that private ownership and the price system give competitive firms stronger incentives and better information on which to act quickly and flexibly during disasters (Horwitz 19).

Wal-Mart was able to move food, water, generators and other goods to areas hit by hurricanes Katrina and Rita following each storm because it has an emergency operations center that is staffed every day around the clock by decision-makers who have access to all of the company's systems. In one case, the company even provided stranded police officers with clothes and ammunition. In areas hit by Rita, illustrated below in Figure 15, Wal-Mart shipped donated clothes and supplies before FEMA was able to provide basic necessities. It has even reopened stores in places with no electricity. Due to Wal-Mart's obsessive approach to communications and information sharing, they have been able to respond to crisis better and faster than the U.S. government.



Figure 14. Walmart hurricane recovery support in action; Hurricane Rita
(from The Design Observer Group)

During a less destructive hurricane, Wal-Mart ships between 200 and 400 containers of goods for sale or relief. In the first two-and-a-half weeks following Katrina, Wal-Mart shipped 2,500 containers to the region and delivered another 517 containers post-Rita. Wal-Mart also set up satellite links for its stores that lost phone or Internet service so that they could stay connected to headquarters; Wal-Mart stores in areas that were without power for weeks were able to keep generators in stock.

Sadly, the Homeland Security's senior officials never viewed the Wal-Mart arrangement as a success story. Nor did they fully understand that the Wal-Mart supply chain had been responsible for pushing the exact emergency supplies that were needed most. Instead, they quietly cut Wal-Mart a check for \$300,000 and moved on. Unfortunately, state and local governments were not as enthusiastic about embracing new methods of procurement and tend to stifle those that develop new methods of operating. For instance, one FEMA employee was struck:

when he saw storm victims being served peanut butter sandwiches that had been trucked in from Florida and canned beans from Ohio, at a cost of

\$14 a day. Louisiana is the culinary capital of the nation, ...and there was no reason to subject its citizens to the inferior grub that was being hauled in on tractor-trailers. With little prodding, the local chefs came up with a better menu than peanut butter and beans. For \$13—a savings of \$26,000 per day—they whipped up a menu featuring seafood pasta and beef with a red wine mushroom sauce. The plan was brilliant on its face: better food for storm victims, a helping hand for local businesses struggling to survive the disaster, a better deal for the government. But Janet Hale nixed the idea. It was a violation, she said, of long-standing contracts for peanut butter sandwiches and canned beans. (Block and Cooper 85)

While it may not be feasible for the federal government to wholly adopt Wal-Mart's organization or methods of operations, there are lessons that can and should be learned from their repeated ability to respond to crisis and to virtually immediately adapt and overcome barriers that seem insurmountable to others.

Starbucks was also able to get aid to hurricane-ravaged areas quickly. When the company got a request from the American Red Cross to donate coffee, managers at headquarters contacted the company's distributors to discuss how they could help. Starbucks determined that it could donate 30,000 pounds of coffee, 235,000 bottles of water and 44,000 pastries without affecting supplies to its retail stores. Efficient communication also helped many companies avoid losing goods in the storm. MIT's Sheffi notes that GM was able to contact its dealers in New Orleans about moving their inventory out of the city and then sent car carriers to pick up the vehicles (Worthen).

Reports issued by committees of the 109th Congress, the White House, federal offices of Inspector General, and the Government Accountability Office (GAO), among others, concluded that the losses caused by Hurricane Katrina were due, in part, to deficiencies such as questionable leadership decisions and capabilities, organizational failures, overwhelmed preparation and communication systems, and inadequate statutory authorities. As a result, the 109th Congress revised federal emergency management policies vested in the president; reorganized the FEMA and enhanced and clarified the mission, functions, and authorities of the agency, as well as those of its parent, the DHS.

Six statutes enacted by the 109th Congress are notable in that they contain changes that apply to future federal emergency management actions. These public laws include the following:

- The Post-Katrina Emergency Management Reform Act of 2006, referred to in this report as the Post-Katrina Act; Sections of P.L. 109–347 (H.R. 4954)
- The Security and Accountability for Every Port Act of 2005, known as the SAFE Port Act; P.L. 109–308 (H.R. 3858)
- The Pets Evacuation and Transportation Standards Act of 2006; P.L. 109–63 (H.R. 3650)
- The Federal Judiciary Emergency Special Sessions Act of 2005; P.L. 109–67 (H.R. 3668)
- The Student Grant Hurricane and Disaster Relief Act; and Sections of P.L. 109–364 (H.R. 5122)
- The John Warner National Defense Authorization Act for Fiscal Year 2007.

Most of these statutes contain relatively few changes to federal authorities related to emergencies and disasters. The Post-Katrina Act, however, contains many changes that will have long-term consequences for FEMA and other federal entities. That statute reorganized FEMA, expanded its statutory authority, and imposed new conditions and requirements on the operations of the agency. The Administration implemented the new authorities through the FY2008 appropriations legislation. The oversight plans of committees with jurisdiction indicate that Members of the 110th Congress evaluate the steps taken by the leadership of FEMA to carry out the expanded legislative mandate. In addition, Members continued to debate legislation pertaining to the recovery of Gulf Coast states. For example, H.R. 1144 would waive disaster assistance cost share requirements for the states affected by the hurricanes (Bea et al. 56).

Hurricane Katrina brought to light that many in the “old” FEMA were ill equipped to handle the disaster because FEMA had become a “revolving door” for employees. Many used the federal job to launch careers in the civilian sector where they were paid more and had upward mobility. FEMA was underfunded, did not actually have the ability to gain command and control of emergency sites due to the fact that they were

not equipped with the necessary gear to operate, and did not invest in training and education for its employees.

In an effort to minimize the continued loss of experience and corporate knowledge within the department, section 10102 of the Post-Katrina Act has charged the FEMA Administrator with development of a Strategic Human Capital Plan that evaluated workforce gap analysis, addressed skill and competency gaps, outlined needs and capabilities, and requires that Congress be updated every five years. In addition, the Post-Katrina Act requires that the Administrator outline the career paths of its employees, to include education, training, experience, and assignments necessary for career progression.

In addition, in an effort to change the future of FEMA and to prevent the rapid turnover of staff that was seen pre-Katrina and during the recovery effort, the Post-Katrina Act authorizes the Administrator to pay recruitment and retention bonuses to individuals in positions that are difficult to fill or for which the retention of an employee's considerable skills is essential and to provide for the professional development of employees by rotating them through various positions within DHS. The provisions authorizing the FEMA Administrator to pay recruitment and retention bonuses are the same as those which govern the payment of such bonuses by executive agency heads under 5 U.S.C. §5753 and 5 U.S.C. §5754, respectively.

Additionally, the Act provides for the establishment of a Surge Capacity Force composed of individuals who will be deployed to respond to natural disasters, acts of terrorism, and other man-made disasters, including catastrophic incidents. These individuals in the Force will be trained and deployed under Stafford Act authority. Force members are not counted against any personnel ceiling applicable to FEMA and may receive travel expenses (including per diem in lieu of subsistence, at rates authorized for other civilian federal employees) when participating in training related to their service on the Force. Most encouraging of all is the fact that personnel serving on the Force must receive appropriate and continuous training on FEMA's programs and policies. As soon as practicable after enactment, the Administrator is to develop and implement the procedures for designating employees who are DHS employees (but not employees of

FEMA) and non-DHS federal employees to serve on the Force, along with other elements of the plan needed to establish that portion of the Force consisting of these individuals (PL. 109–295, §624.) While a noble thought, the act provides for the personnel during times of need, but does not prevent those volunteers from losing their established jobs upon their return to work. There are no protections established for the volunteers, unlike military Reservists are protected by U.S. Code Title 10.

Prior to Hurricane Katrina, FEMA used two groups of temporary employees to meet the unexpected (surge) needs of catastrophes: Disaster Assistance Employees (DAEs) and Cadre-On-Response Employees (CORE). The DAE detail was normally a brief deployment to disaster sites while the CORE detail lasted up to four years. A third group of temporary employees known as Disaster Temporary Employees (DTEs) was subsequently created to augment the DAEs. All three groups were substantially augmented by local hires at the disaster sites associated with Hurricane Katrina.

The Post-Katrina Act not only suggests that personnel be retained once proven invaluable, but also allows for training for employees that either want or require it. “All employees must be provided with the opportunity to acquire the education, training, and experience, and as appropriate, participate in the Rotation Program (established under §622(a)) that will allow them to qualify for promotion.” In addition, the DHS has the responsibility of managing schools that deal with National Preparedness. The schools include the Federal Law Enforcement Training Center, the National Fire Academy, and the Emergency Management Institute (EMI). EMI specifically provides Contingency Contracting Courses both in-residence and distance learning options. The programs train individuals to prepare for, respond to, and recover from terrorist attacks. Some of the training programs are designed for personnel working in critical infrastructure sectors. Others are intended for personnel who are not identified with specific critical infrastructure but respond to terrorist attacks, regardless of location or target.



Figure 15. Hurricane Katrina damage in New Orleans (from Young website)

Regrettably, there is no evidence of a requirement for FEMA staff involved in contracting to be members of the Contingency Contracting Corps, nor is the evidence that they are required to receive training through Defense Acquisition University (DAU) or EMI prior to being hired by FEMA. It would stand to reason that now with the luxury of time on the government's side, it would be to its benefit to ensure its budget staffers are trained and qualified to draft contingency contracts, know how they should be worked through the government system, and be ready to do so on a moment's notice. The Contingency Contracting Corps web page even provides a checklist of items that should be packed in case of emergency, so if one is called up, they will have essentials to take care of themselves until assistance arrives. The training is available, but still underutilized.

Despite the overwhelming amount of challenges and mistakes that occurred after Hurricane Katrina, one of the most important benefits and successes was the chance to reevaluate a failing system and bolster it for similar events in the future, such as

Hurricane Sandy in 2012. Even though New Orleans still has not recovered fully, as illustrated in Figure 16, the improvements to contingency contracting would not have been as wholly possible without the lessons learned from Hurricane Katrina.

H. CHAPTER SUMMARY

Reports issued by committees of the 109th Congress, the White House, federal offices of Inspector General, and the GAO, have concluded that the losses caused by Hurricane Katrina were due, in part, to deficiencies such as questionable leadership decisions and capabilities, organizational failures, overwhelmed preparation and communication systems, and inadequate statutory authorities. As a result, the 109th Congress revised federal emergency management policies vested in the President; reorganized the FEMA and enhanced and clarified the mission, functions, and authorities of the agency, as well as those of its parent, the DHS.

A large portion of the destruction witnessed following hurricane Katrina could have been avoided with a few e-mails, pre-placed funding, and training. Exercises had been run simulating the damage that was realized during Hurricane Katrina, but the information was not utilized nor was it shared. No one of authority took the initiative to identify properly trained personnel capable of meeting the unique contracting needs nor were the types and quantity of pre-existing contracts verified or vetted by FEMA or state officials. While the government struggled to provide food, water, and transportation to survivors due to bureaucratic “red tape” and first responder’s inability to identify personnel that could authorize the contract request and funding, private industry was able to respond literally within hours of the catastrophic event. Hurricane Katrina demonstrated the government’s inability to respond rapidly to enormous emergencies. It was evident that the U.S. government had changes to make if it wanted to keep up with private industry.

Due to its discoveries, the 109th Congress enacted six statutes which contain changes that apply to future federal emergency management actions (Bea et al. 56):

- The Post-Katrina Emergency Management Reform Act of 2006 (the Post Katrina Act)

- The Security and Accountability for Every Port Act of 2005 (The Safe Port Act)
- The Pets Evacuation and Transportation Standards Act of 2006
- The Federal Judiciary Emergency Special Sessions Act of 2005
- The Student Grant Hurricane and Disaster Relief Act
- The John Warner National Defense Authorization Act for Fiscal Year 2007

In an effort to maintain the federal ‘corporate’ knowledge of its contractors, Congress utilized section 10102 of the Post-Katrina Act to charge the FEMA Administrator with development of a Strategic Human Capital Plan that evaluated workforce gap analysis, thereby addressing skill and competency gaps, outlining needs and capabilities, and requiring that Congress be updated of his findings every five years. In addition, the Post-Katrina Act requires that the Administrator outline the career paths of its employees, to include education, training, experience, and assignments necessary for career progression.

In hopes of preventing the rapid turnover of staff that was seen pre-Katrina and during the recovery effort, the Post- Katrina Act authorizes the Administrator to pay recruitment and retention bonuses to individuals in positions that are difficult to fill or for which the retention of an employee’s considerable skills is essential and to provide for the professional development of employees by rotating them through various positions within DHS. The provisions authorizing the FEMA Administrator to pay recruitment and retention bonuses are the same as those which govern the payment of such bonuses by executive agency heads under 5 U.S.C. §5753 and 5 U.S.C. §5754, respectively.

Additionally, the Act provides for the establishment of a Surge Capacity Force composed of individuals who will be deployed to respond to natural disasters, acts of terrorism, and other man-made disasters, including catastrophic incidents. These individuals in the Force will be trained and deployed under Stafford Act authority. Force members are not counted against any personnel ceiling applicable to FEMA and may receive travel expenses (including per diem in lieu of subsistence, at rates authorized for other civilian federal employees) when participating in training related to their service on the Force. Most encouraging of all is the fact that personnel serving on the Force must

receive appropriate and continuous training on FEMA's programs and policies (PL. 109–295, §624).

The Post-Katrina Act not only suggests that personnel be retained once proven invaluable, but also allows for training for employees that either want or require it. “All employees must be provided with the opportunity to acquire the education, training, and experience, and as appropriate, participate in the Rotation Program (established under §622(a)) that will allow them to qualify for promotion.” In addition, the DHS has the responsibility of managing schools that deal with National Preparedness and the training of and implementation of better processes for Contingency Contracting Officers to follow. The schools include the Federal Law Enforcement Training Center, the National Fire Academy, and the Emergency Management Institute (EMI). EMI specifically provides Contingency Contracting Courses both in-residence and distance learning options. The programs train individuals to prepare for, respond to, and recover from terrorist attacks. Some of the training programs are designed for personnel working in critical infrastructure sectors. Others are intended for personnel who are not identified with specific critical infrastructure but respond to terrorist attacks, regardless of location or target.

In an effort to specifically address the need for better contingency contracting officers within the DOD, Congress identified the Army to lead the contingency contracting ‘charge’ for the DOD. The ACC, headquartered at Redstone Arsenal in Alabama, is a two-star command with two subordinate one-star commands and five major contracting centers that provide support to AMC's life cycle management commands and MSCs, all designed to provide contracting support to several program executive offices and program managers supporting the U.S. Army's major acquisition programs. ACC offers the contracting expertise of some of the best-trained people in the Army, ready to support the war fighter while ensuring responsible stewardship of taxpayers' funds (Army Contracting Command).

In addition to the corporate knowledge provided by the Army, the Gansler Report suggested the establishment of the Contingency Contracting Corps and required that the government provide education to contractors. While all of the congressional requirements

have been met, there is still no requirement for federal contractors to become members of the CCC nor are there any incentives for membership. While a noble thought, the act provides for the personnel during times of need, but does not prevent those volunteers from losing their established jobs upon their return to work. There are no protections established for the volunteers, unlike military Reservists are protected by U.S. Code Title 10.

While training is readily available at FLETC, NFA, and EMI, and DAU, EMI specifically provides Contingency Contracting Courses both in-residence and distance learning options. However, there is no evidence of a requirement for FEMA staff involved in contracting to be members of the Contingency Contracting Corps, nor is the evidence that they are required to receive training through DAU or EMI prior to being hired by FEMA.

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V. HURRICANE SANDY (2012)

A. INTRODUCTION

Eighteen years after the Northridge earthquake and seven years after Hurricane Katrina, the United States would be struck by another natural disaster that will be etched in American's memories for years to come. Fortunately, the lessons learned from Northridge, Katrina, and other disasters played a significant role in preparing for and responding to Hurricane Sandy. Everything did not go right with the preparations and response to Sandy, but many things did go fairly well. Contingency contracting preparations and response, along with other essential response elements, greatly assisted in the response to Sandy and showed that FEMA and other government organizations do have a "learning curve" when it comes to disaster response.

B. THE HURRICANE AND PREPARATIONS

Hurricane Sandy struck the eastern seaboard of the United States early in the morning on October 29, 2012, making landfall near Brigantine, New Jersey. While only classified as a Category 1 hurricane as she came ashore, the storm would quickly earn its place in the history books as one of the worst natural disasters that has ever happened in the United States.

Hurricane Sandy began from a tropical wave in the western Caribbean Sea on October 22, 2012. Within hours of forming, the storm was officially labeled as Tropical Storm Sandy. Sandy moved slowly northward and increased in strength, reaching Hurricane status on October 24th as she approached the Greater Antilles islands. Sandy's first victims were in Kingston, Jamaica where one person was killed and approximately \$100 million in damage was done. As she moved northward from Jamaica as a Category 2 hurricane, Haiti and the Dominican Republic were hit next and both countries suffered severe flooding that left hundreds of thousands homeless and 55 dead.

Hurricane Sandy continued her journey northward, soon wreaking havoc on Cuba and then the Bahamas, both locations suffering fatalities and extensive flooding, something which Sandy proved to be remarkably efficient at. After the Bahamas, the

storm emerged into the Atlantic as a Category 1 storm and continued on a largely north/northwest trajectory (Figure 17). At this point, virtually all models predicted the storm would make landfall in the United States. However, it was not yet possible to predict exactly where it would make landfall and what areas would be most affected.



Figure 16. Hurricane Sandy storm track (from The Weather Channel website)

On Sunday, October 28th the storm's track began to solidify and the models began to predict landfall somewhere between the Chesapeake and Delaware Bays, with the states of Maryland, Delaware, and New Jersey as the likely candidates to receive Sandy first. As the storm moved northward it lashed the entire eastern seaboard with high winds and rain, causing extensive flooding in many areas that never received anything close to hurricane force winds. In fact, before Hurricane Sandy was done, the storm would affect 24 states, ranging from Florida to Maine and westward as far away as Michigan and Wisconsin. Even Canada was affected and suffered two fatalities in Ontario and \$100 million in damage throughout Quebec and Ontario.

During the night of October 28th, the storm made its final course adjustments while over the Atlantic and set its sights on the Jersey shore for landfall on the morning of the 29th. Hurricane Sandy at this point was immense and became the largest north

Atlantic hurricane on record, spanning over 1,100 miles in diameter. Because of the storms landfall location in proximity to the Chesapeake and Delaware Bays, large and dangerous storm surges were expected in these two bodies of water and surrounding tributaries.

As Sandy churned over New Jersey and continued north toward New York, she left widespread power outages, flooding, downed trees and fatalities in her wake (Sandy Hook, NY, Hurricane Sandy flooding). New York City would suffer particularly badly, with flooded streets, tunnels and subways that literally paralyzed the city for weeks to come. In the aftermath of Sandy, the New Jersey shore communities (Figure 18) and the New York City area would greatly benefit from governmental relief efforts and contingency contracting for services such as fuel, food and water, sanitation services and particularly debris clean up.



Figure 17. Hurricane Sandy; New Jersey shore community flooding and damage
(from FEMA website)

Prior to Hurricane Sandy making landfall in New Jersey, surrounding local and state governments, along with the federal government began to prepare for the storms arrival. National media coverage included areas as far inland as Ohio and urged them to prepare accordingly for the impending hurricane and highlighted the fact that the location of landfall and areas that would be hardest hit was still uncertain (Gibbs and Holloway 3). As storm preparation plans were implemented, it gradually became apparent that landfall was going to take place in New Jersey and that New York City would also be seriously impacted.

With this knowledge, several key events happened. The Federal Emergency Management Agency (FEMA), who is the lead agency within the Department of Homeland Security (DHS) for disaster response, activated emergency response plans and began establishing incident support bases in various states, setting up logistical staging areas and deploying incident management teams.

FEMA also executed an existing contingency contract for ground fuel with the Defense Logistics Agency (DLA), pre-positioning 60 refueling trucks in the northeast and later adding another 240+ trucks to the operation as the magnitude of the disaster emerged in the days following the storm (Shawn). This action proved to be prescient and significant because fuel was critically short for first responders and generators during the early stages of the disaster.

Of significance during the preparation stages, the acquisition and contracting flexibilities allowed under FAR 18.201 (increased thresholds for micro-purchases, Simplified Acquisitions, and SF44s) and FAR 18.203 (preference given to local businesses during declared major disaster under the Robert T. Stafford Disaster Relief and Emergency Assistance Act) were authorized after the President made emergency declarations on 29 Oct for the eleven states who were clearly going to be impacted (Tucker).

One confusing area regarding the use of acquisition flexibilities during disasters is *when* are they actually authorized? With the emergency and major disaster declarations by the president, it was then up to the “head of agency,” in this case the Department of

the Interior Assistant Secretary for Policy Management and Budget to specifically specify and authorize the acquisition flexibilities to be granted for use. The Department of the Interior followed up the declarations with a Department of the Interior Acquisition Policy Release (DIAPR) on November 2, 2012, which formally granted the use of the acquisition flexibilities and also added specific guidance on Justification and Authorizations (J&A) and Determinations and Findings (D&F) (Department of the Interior).

The following day the Governors of New Jersey, New York, and Connecticut all requested and were granted major disaster declarations by the President (FEMA). A major disaster declaration is a more significant designation than an “emergency declaration” and under the Stafford Act allows for significant funding and relief efforts to affected states and local communities (McCarthy). More states would receive a presidential disaster declaration in the days and weeks to come.

As part of their pre-hurricane preparations FEMA also coordinated with the DOD and alerted them that assistance may be required. NORTHCOM, the DOD combat commander responsible for North America was the lead agency that coordinated the overall DOD response to Hurricane Sandy. Post-Katrina analysis revealed significant weakness in DOD support to FEMA and in the aftermath of Katrina, much energy and time has been spent detailing where the weakness were and making recommendations to fix the issues. Issues such as overall unity of command, coordination between active, reserves and National Guard components, multi-state National Guard support, timeliness of DOD response, and technical (equipment) integration challenges between units all were common themes that emerged from Katrina (U.S. Government).

Many of these FEMA/DOD issues were addressed with changes to policy and legislation in the years between Katrina and Sandy. The idea and evolution of the “dual-status” commander, an officer who can command both National Guard and active duty forces was developed and implemented and achieved some success, albeit limited, during Hurricane Sandy. The issue of multi-state National Guard unit coordination also occurred during Sandy and it appears that the same challenges that surfaced during Katrina also happened during Sandy, indicating little to no progress in this particular area. These and

other issues will be further analyzed later in this chapter. Additionally, we will also review what post Katrina DOD changes were successfully implemented and proven during Hurricane Sandy, which were not, and recommend further changes to continue the efforts to enhance DOD integration into the National Response Framework (NRF).

FEMA pre-hurricane personnel deployments for Hurricane Sandy were on par with Hurricane's Isaac and Irene and their post-storm personnel response far exceeded those Isaac and Irene (Figure 19). By most accounts, FEMA was reasonably well prepared in most disaster response areas but in some areas their preparations fell short and were not sufficient during the initial response phase.

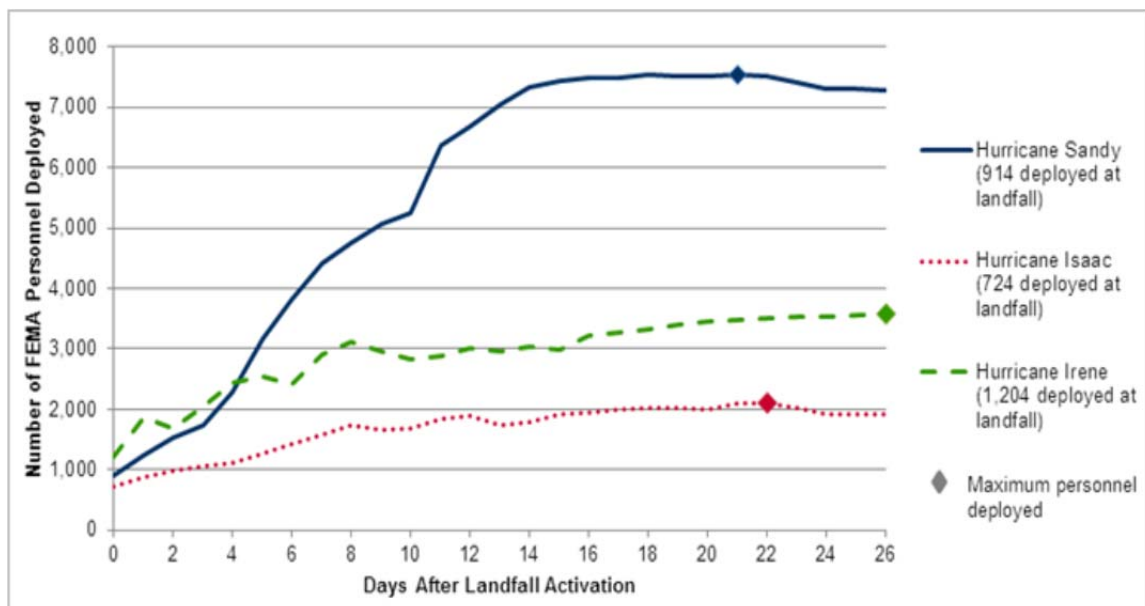


Figure 18. Hurricane Sandy FEMA response compared to Hurricane's Isaac and Irene (from FEMA website)

In New York, Mayor of New York City, Michael Bloomberg, activated New York City's Coastal Storm Plan (CSP) and ordered a mandatory evacuation of the five densely populated boroughs in New York City. Unfortunately, for a variety of reasons very few residents chose to evacuate, particularly from "Zone A" which included most areas likely to be flooded and damaged by storm water (Gelinas 12). Some of the reasons people chose not to evacuate were the desire to protect property from looters, too old or

disabled to move easily, lack of transportation, and failing to realize how bad Sandy would actually be. To compound the problem of residents remaining in high-risk areas, very few had stockpiled enough supplies to last for a couple weeks. This lack of planning would create additional challenges during the recovery phase.

New York's City's CSP had been created in 2000 for just such an event and had been used once previously for Hurricane Irene in 2011. The CSP is a comprehensive natural disaster plan that addresses areas such as Continuity of Operations, Search and Rescue, Emergency Operations Center standup and Logistics. Contingency contracting and the importance of being able to quickly contract for needed services is addressed in several areas of the CSP, specifically the Logistics section and the Citywide Incident Management System (CIMS) section (New York University).

New York City was not the only city with existing hazardous weather/natural disaster plans in place. Wilmington, Delaware; Philadelphia; Boston and most coastal towns had weathered hurricanes and northeasters in the past and had standing plans that were put into action. In Boston, as part of the city's emergency preparations, local power companies contracted for additional utility repair technicians to be on standby to help repair damage to power lines and other power grid infrastructure after the storm had passed (Boston Globe).

All along the east coast, state, city and local Emergency Response Centers sprang to life and prepared for Hurricane Sandy. In Pennsylvania, on October 26th the Pennsylvania Emergency Operation Center was up and functioning, coordinating efforts with local Emergency Response Centers, the Red Cross and the National Guard (Marcheskie). Further up the coast in Rhode Island, the governor made a Declaration of Emergency on October 28, 2013, and the state's Emergency Management Agency had been functioning several days prior to the declaration (Wikipedia). At a local level, cities and towns of all sizes activated their local Emergency Response Centers to support their communities.

Thanks to accurate weather forecasting and existing natural disaster plans, as Sandy approached the northeast on October 29, 2013, the areas in the pathway of

Hurricane Sandy were reasonably well prepared for the storm's impact and they had handled the preparations in an organized and effective manner (Gibbs and Holloway 9). In fact, in terms of disaster preparedness to include contingency contracting planning, the areas hardest hit by Hurricane Sandy were, by the standards existing at the time, about as prepared as they could be. Unfortunately, the power and magnitude of the storm was just too much and no level of preparations would have spared much of the northeast significant devastation and a very challenging recovery period.

C. RESPONSE: IMMEDIATE AND LONG TERM

At the Executive level, the immediate response was President Obama's declaration of New Jersey, New York and Connecticut as "Major Disaster Areas" on October 30th, paving the way for real response efforts to begin (FEMA). Many other states were declared "Major Disaster Areas" also as time and events unfolded.

The Federal Emergency Management Agency (FEMA), operating underneath the Department of Homeland Security (DHS), is the primary federal agency tasked with responding to natural disasters. With that role, it is no surprise that FEMA was at the forefront of response efforts for Hurricane Sandy. According to FEMA's Hurricane Sandy After-Action Report, their stated immediate response goals were:

In the first 72 hours of response operations, FEMA focused efforts on supporting first responders to save lives, maintain safety, restore power, and stabilize communities with the FEMA Administrator emphasizing response priorities as: people, power restoration, points of distribution for commodities, and pumping flooded tunnels. (FEMA)

Because of lessons learned from Hurricane Katrina, FEMA's initial community recovery efforts for Hurricane Sandy were improved over Katrina's response. However, not all went well and like previous FEMA disaster responses, lack of organization and planning continued to plague FEMA in some areas.

One FEMA team from the Washington D.C. area was rushed to Fort Dix, New Jersey prior to the storm's arrival. Once they arrived, the onsite FEMA coordinator told them "I don't know why you were rushed here because we don't need you." After the storm passed they waited days for a mission to be assigned to them, all the while

watching the destruction and recovery efforts on television even though they were only a short distance from areas with significant storm damage. The team's leader pleaded with local coordinators to give his unit a mission and told his supervisor back in Washington that "My people are being told to go sightseeing" and that personnel resources were being wasted (Chiramonte). The team was eventually committed to the recovery but not exactly the type of organization one would expect during a recovery effort as massive as Sandy's where recovery personnel were certainly needed in many areas.

One of the key agencies that support's FEMA during disaster recoveries is the U.S. Army Corps of Engineers (USACE). During Sandy the USACE performed an incredible amount of work both during the immediate response and probably more significantly during the long-term efforts to de-water flooded areas, remove debris, and restore beaches and sand dunes.

One significant contracting feature of the USACE is their Advanced Contracting Initiative (ACI). This program began in 1999 and allows for the award of Indefinite Delivery Indefinite Quantity (IDIQ) Single Award Task Order Contracts (SATOC) and Multiple Award Task Order Contracts (MATOC) before a disaster ever occurs (USACE). These contracts are primarily used for debris removal but also for power generation (generators), general construction, and other areas (Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina 15). Currently the USACE has standing debris removal ACI contracts with five companies within the United States.

Having learned hard lessons in the past with respect to responsiveness to natural disaster recoveries, the USACE developed the ACI program to be better prepared to execute their missions quickly and without the normal processing time that government contracting actions take. During Hurricane Sandy the USACE executed several of their debris removal and general contracting ACI contracts during the preparation phase of the recovery, greatly speeding the recovery in certain areas that were devastated with mixed debris of all kinds (U.S. Army Corps of Engineers 66).

The USACE's use and refinement of ACI contracts during Hurricane Sandy is a shining example of an organization thinking ahead and responding to a repeat after action item from other natural disaster responses. The ACI program was developed prior to Hurricane Katrina but in The Federal Response to Hurricane Katrina Lessons Learned document it mentions several times the need for existing pre-arranged contracts to be in place *prior* to a disaster striking. As already noted, some state and cities are also following suit and entering into standing contingency contracts as part of their standing disaster relief plans.

The Defense Logistics Agency (DLA) is another of the federal agencies that FEMA often uses to support disaster relief. As previously mentioned, DLA had existing contingency contracts for fuel trucks and they pre-staged about 60 trucks prior to Sandy's arrival. When FEMA requested fuel on Nov 1st, the fuel trucks were on station and supporting within hours. The number of fuel trucks contracted by DLA would grow rapidly over the next several weeks (Shawn 5). DLA also contributed significantly in the early phases of the response with logistics support of food, water, cots, and clothing. Also, many of the de-watering pumps used by the USACE were procured and shipped by the DLA (Shawn 6).

The Department of Defense (DOD) is another federal agency that often provides support to FEMA during natural disaster recoveries. During Sandy, the DOD at the federal and state (National Guard) levels provided a large amount of support. On 30 October, Secretary of Defense Panetta directed that the DOD provide any support requested by FEMA during the recovery (FEMA). At the federal level, the DOD worked with FEMA to determine how to best use DOD assets before putting plans in motion. Unfortunately, the requirement to work together to determine how to best employ DOD forces cost precious time and was something that should have been done *prior* to the disaster occurring. DOD's timeliness of response to major disasters has often been criticized and Hurricane Sandy is no exception; more to follow on this subject. At the state National Guard level, *eleven* Governors called out their National Guard with a total of 7,400 Guardsmen responding to the call. National Guard personnel responded quickly

and worked with first responders during search and rescue missions, conducting route clearing, and delivery of supplies (FEMA).

One area that has plagued DOD and National Guard support during previous natural disaster recoveries is a lack of “unity of command” (GAO). This issue arises when both National Guard troops, who are “owned” by the state’s governor and generally operate under Title 32 U.S.C. and federal troops (Army, Marines, etc.) who are “owned” by the Secretary of Defense and generally operate under Title 10 U.S.C. both respond to a disaster but come with their own chains of command and tasking authority. This creates a confusing and disjointed approach to the overall DOD response and both military organizations are left uncertain of who is in charge, who is coordinating the overall DOD efforts, and who has tasking authority for the state and federal units.

DOD has grappled with how to address the “unit of command” issues for some time and the answer that has emerged is the “dual-status” commander. The concept of a “dual-status” commander was developed during the 2004 G-8 Summit in Georgia and was eventually officially embraced in January 2010 when ten governors met with Secretary of Defense Panetta to formally agree on the concept and implement it (Insinna). A dual-status commander can be a Guard or active duty officer who has been specially trained and can command both federal and National Guard troops. The dual-status commander concept was used twice prior to Sandy during Hurricane Isaac and the Colorado wildfires. However, it had never been used during a disaster the magnitude of Sandy.

During Sandy multiple dual-status commanders were utilized but the implementation was weak and the results were only marginally successful. Additionally, the concept had only been developed for use with a single state’s National Guard forces and federal forces. The Sandy response included multiple states (eleven states’ National Guard units) and the framework for that had never been developed. The GAO “Civil Support” article mentions several relevant observations from the Sandy NORTHCOM and U.S. Army after action reports:

- The command and control structure for dual-status commanders, the joint coordinating element, and higher headquarters was unclear to federal military personnel.
- Command relationships were not initially clear to all personnel, and some missions were executed without the approval/awareness of the dual-status commander.
- There was not a well-defined chain of command or process to manage coordination of efforts of forces not assigned to a task force or dual-status commander.

Clearly, the use of dual-status commanders during Sandy was not a huge success but the concept does appear to be a step in the right direction. With further refinement, development of models for multi-state disasters, exercise and actual use in future disasters, the dual-status commander should make future DOD disaster responses more coordinated and efficient. However, like any military operation, without routine exercises and realistic training events, the concept will always fall short during actual execution—when it really matters. Funding and support for yearly CONUS disaster response exercises is imperative to prevent more “lessons learned” while DOD is actually participating in disaster relief in conjunction with DHS. Yearly NORTHCOM/DHS coordinated training MUST happen to bridge the current gap between these two organizations. Realistic yearly training that is hosted in various geographical areas of the country and simulates the major natural disasters (hurricanes, earthquakes, floods, tornadoes etc.) likely to be supported by DOD is the only way to make the DOD response more effective and timely. I would also propose a large-scale quadrennial DOD/DHS training event that simulates a Hurricane Sandy type natural disaster and forces all major stakeholders to participate and work side by side as they would during the real thing.

At the state and local levels during the immediate response the State Police, County Sheriffs, local police and EMS personnel were the real face of the response for the first 24 hours or so. As always, they had to deal with the immediate shock of being first on the scene to some horrific and heart breaking situations. The information received from them was instrumental in identifying where the hardest hit areas were and where to direct follow on assistance to save lives and property.

After the first 72 hours the follow on, longer-term response began—and some cracks began to show in FEMA’s efforts and organization. Within this phase of the response there were significant contingency contracting actions which supported the recovery efforts. At the highest level, FEMA continued to coordinate the recovery efforts, seeking to synchronize the response efforts of all the various agencies, avoid duplicative efforts and ensure resources were being used efficiently and effectively.

However, down at the street level of FEMA’s response, all was not well and there were some problem areas. As had happened in previous FEMA responses, it seemed that the survivor centric focus was lost somehow and the level of communication at various levels was poor.

“Nobody communicates anything with you” was what Joe Casale of Breezy Point, N.Y. had to say about FEMA as he struggled to get his home repaired in the aftermath of Sandy. Poor communication seemed to be a recurring theme with FEMA throughout Sandy; poor communication prior to the storm regarding what to expect during the recovery phase, FEMA employees in the field who did not know what to tell survivors, and poor communication with survivors after the storm while trying to get FEMA assistance all are recurring themes during Hurricane Sandy (Leitsinger).

By most accounts FEMA did a decent job getting personnel into place prior to the storm and setting up recovery operations in the correct areas. During the first 72 hours when survival and helping victim’s basic needs were the goals, FEMA functioned fairly well but there were also reports of undertrained FEMA personnel in the field who simply did not know what to tell survivors—precisely when they desperately needed information on what to do. But as the recovery merged into the longer term, more deliberate phase, other problems surfaced at FEMA. As residents sought assistance with home repairs and rebuilding, it seemed that FEMA was unable to communicate effectively regarding HOW the programs functioned and once a person applied, there was very little follow up communication regarding a claim’s status.

About a month after Sandy, frustrations with FEMA programs boiled over at a Staten Island meeting with FEMA arranged by the borough’s President James Molinaro.

Resident Scott McGrath, who had met President Obama during a recent tour of the Sandy destruction when Obama had pledged to “cut through the red tape” for Sandy victims was very frustrated. “You were there when I met Obama, and I told the president....that the middle class was getting the royal finger. And he said ‘FEMA works for me.’” “FEMA ain’t doing nothing,” McGrath added. “They keep going around in circles.” Other residents echoed McGrath’s frustrations and anger and the meeting became a shout down as over 1000 residents shouted at FEMA officials who were forced to cower, listen and write down the complaints.

Farther south in Highlands, New Jersey, Kathy Self applied for FEMA assistance and was given a claim number and when she called to check on her claim status the recording simply said “You do not qualify” with no explanation. When she applied, nobody at FEMA bothered to explain to Self the process and different levels of assistance, how private insurance interacts with FEMA programs and how second homes (vacation homes) are treated under FEMA programs (they are not eligible). Self was in tears over the “You do not qualify” recording but in reality it was just the first step in the process and did not mean she was not eligible for other types of FEMA assistance. In reality she was eligible but her claim could not be settled until her private insurance company had made their assessment first. It is true that individuals must take some responsibility for asking questions and learning the process during something like a disaster recovery but FEMA did not do anyone any favors with their lack of up-front information regarding their programs and policies (McGlone).

One quotable quote regarding communication from FEMA is from Alberto Pilot, FEMA’s Public Information Officer. When asked about issues such as the one that Kathy Self dealt with, Pilot said “Most of the confusion about FEMA coverage and assistance results from a misunderstanding of FEMA’s mission. FEMA is just temporary assistance. The disaster loans are meant to get you back where you were” (McGlone). That is great information—but only FEMA knows it! FEMA’s *pre-storm communication plan*, or lack thereof, was very weak and is at least partially to blame for much of the confusion that resulted during the recovery phase. The sad part is, with current technologies, there is no excuse for it.

With a multitude of ways to disseminate information electronically these days, FEMA should have been pushing FEMA program and processes information to potentially affected areas days before the storm's arrival. Text messaging, email, television, smart phone Apps, Facebook, Twitter to just name a few are low cost and effective ways to spread mass information to people. Before people are devastated by a disaster and computers and phones are no longer charged, they need to at least have the opportunity to read about FEMA programs and processes so they have an idea of what to expect during the recovery phase if they truly are hit hard and need assistance. FEMA need only to look at NYC's disaster preparedness and response plan to see an effective communications plan similar to what I described above. NYC's plan was used the first time during Hurricane Sandy and is considered one of the success stories from the city's response.

One noteworthy FEMA program that appears to have promise is the Rapid Repairs program. A similar program called Sheltering and Temporary Power (STEP) program was stood up in NYC and operated by the city. With so many houses damaged and people needing shelter, these programs sought to rapidly repair houses enough to make them habitable again and allow families to move back in. Cas Holloway, Deputy Mayor for NYC Operations, summed up the program:

We thought some basic repair work....that would enable families to basically shelter in place, be in their homes, be safe and then begin the real work of rebuilding and doing it in their communities not away from (them).

Repairs largely consisted of restoring electrical power, heat, and water. Many Sandy victims lauded these programs but they were mainly the ones at the front of the list who had their work done early. In New York City three months after Sandy, some 7,000 households were still waiting for the work to be completed.

The FEMA Rapid Repairs program is a good concept and getting people back into their homes as quickly as possible is essential to getting people back to work and rebuilding their communities. The Rapid Repairs program was initiated two weeks after Sandy and eventually nine general contractors were hired with over one hundred sub-

contractors. Perhaps if the program had existed prior to the recovery and contracts already existed with the general contractors, the program could have been more efficient and timely during execution. David Abramson, the deputy director for Columbia University's National Center for Disaster Preparedness said he was impressed with the Rapid Repairs concept because it addressed some key barriers facing communities when they begin the recovery process, such as having credentialed and trusted contractors. He also added that with respect to the program and Hurricane Sandy recovery, "I think it falls in the category of good plan, poor implementation" (Leitsinger).

Other federal agencies supporting FEMA continued to pour personnel and money into the Hurricane Sandy response. The DLA expanded its logistical support operations, moving fuel, clothing, and engineering equipment around the response area. DLA would ultimately deliver over 18 million gallons of fuel during the recovery and at one point had 286 fuel trucks on contract making deliveries (DLA Loglines). The Health and Human Services (H&HS) department mobilized 850 medical and public health personnel in support of FEMA. The Department of Energy (DOE) established a "fuel hotline" to help identify gas stations that required electrical generators to restore operations and be able to distribute fuel. The USACE steadily ramped up its de-watering operations in New York and New Jersey, ultimately removing 470 million gallons of water from fourteen separate locations (U.S. Army Corps of Engineers 66).

The DOD's efforts significantly increased during the follow on response phase, although efforts were never fully coordinated and as mentioned previously, suffered from lack of coordination and overall unity of command. Ultimately over 4,000 personnel from all services deployed to the recovery area, to include three Navy ships with the 26th Marine Expeditionary Unit (MEU) embarked. Helicopters from the 26th MEU played a pivotal role conducting logistics movements around the recovery area, particularly with generators and electrical infrastructure equipment. Army and Navy divers conducted pier repairs and recovery at the World Trade Center site and Marine and Air Force engineers assisted with de-watering operations at various locations around New York City. Lastly, the U.S. Coast Guard, actually part of DHS, conducted search and rescue and maritime

security missions in the waters surrounding the recovery area. Truly a “joint” DOD response if ever there was one (FEMA website timeline).

At a more local level, New York City continued their internal recovery efforts, contracting for 150 electricians to restore power in 400 buildings that were part of the New York Housing Authority. They also contracted for car and boat towing and removal services, eventually removing over 3400 derelict cars and 180 wayward boats. The NYC Human Resources Administration contracted for 719,000 lunches and dinners (Gibbs and Holloway 39). Worthy of mention, New York City’s official After Action report mentions numerous times the need to have standing contracts in place for key recovery services *prior to a disaster* (Gibbs and Holloway 34). This is a recurring theme with other organizations and as we have seen from the USACE and DLA, many agencies have moved toward standing contingency contracts that significantly reduce response time when disasters strike.

One NYC organization that truly shined during Hurricane Sandy was the Metropolitan Transportation Authority (MTA). The MTA manages subways, commuter rail lines, and all the tunnels in NYC. MTA showed real leadership by making an early decision to shut down their operations in time to move most equipment (buses, rail cars etc.) to higher ground, saving them from being flooded with corrosive salt water—as happened in Hoboken, NJ on the other side of the Hudson River.

Once Sandy passed, MTA quickly began work on restoring some level of mass transit service to the city. With subway and train tunnels flooded, the city put over three hundred buses into use as an improvised mass transit service that moved recovery volunteers around and allowed some people to return to work, long before the commuter trains and subways were running again. MTA chairman Joe Lhota stated afterward:

For three days, we had to improvise. We used 330 buses from our existing bus fleet to replace service for 1.4 million customers who commute from Brooklyn to Manhattan every day. (Gelinas, 10)

In the Queens Borough, the Queens Library also stood out as a model of community support during the aftermath of Sandy. In an area without power for several weeks, the manager of the library, recognizing that people needed a communal place to

congregate and communicate, opened the library every day and eventually got a generator that allowed some power and the ability for people to recharge phones and computers. The library was a big community morale booster and also became a large donation site for food and other essential goods (Gelinas 12).

Failed areas of New York's response include the notoriously bad New York City Housing Authority (NYCHA), which manages the city's housing projects and the Long Island Power Authority (LIPA), which manages the power grids on Long Island. The NYCHA showed little foresight when it came to anticipating a need for power generators and replacement boilers for their over 400 buildings—they had none and made no efforts to get any as the storm approached. The LIPA, which is known to be a corrupt and inept organization, failed to keep trees adequately trimmed and cut back which allowed numerous power lines to be downed which could have been prevented. They also had antiquated computer system that made it virtually impossible for customers to communicate with them and for them to communicate internally (Gelinas 18).

D. CONTINGENCY CONTRACTING SUPPORT

In the previous chapters on immediate and long-term response to Hurricane Sandy, many examples of federal, state and local contingency contracting support were cited. At the macro level, the degree of contracting support during Hurricane Sandy was staggering in terms of scope and cost. Although Sandy only affected the northeast portion of the United States, 34 states participated in the contracted recovery efforts to some degree. Figure 20 from the FederalTransparency.Gov website depicts the states that received contracts in the wake of Hurricane Sandy. If you go to <http://www.federaltransparency.gov/funded/Sandy/Pages/Sandy-Award.aspx> website, this chart is interactive and you can see the details and cost of each individual contract.



Figure 19. States that received contracts during the Hurricane Sandy recovery (from Federal Transparency.Gov website)

The states to receive the largest number of contract awards and value are no surprise; New York and New Jersey. There is a concerted effort that is regulated by law (part of the Stafford Act) to make every attempt to utilize local business during disaster relief contracting awards. As of October 3, 2013, New York had received 626 contract awards totaling \$456,944,872. New Jersey had received 385 awards totaling \$221,924,476 (Recovery Accountability and Transparency Board).

Table 6 depicts just a small screenshot of a few contracts awarded in support of Sandy recovery efforts. Note the *various agencies* that awarded the contracts and the *geographically dispersed locations* of the companies that received the contracts. One issue worthy of mention here is that had there been more widespread use of federal, state and local existing pre-storm contingency contracts with local and regional business, there probably would not have been the need to contract with so many businesses that were hundreds and thousands of miles away. This would help keep the recovery phase in line with the Stafford Act's intent, make the response more responsive, and support local and regional businesses. Possibly the biggest benefit though would be to reduce the number of contracting actions done in a post-storm emotionally charged environment when competition is often not used for the sake of expediency and Justification and Approvals (J&A) for sole source contracts are more prevalent, often resulting inflated prices.

MCKINSEY & COMPANY, INC. WASHINGTON D.C.	WASHINGTON	DC	20036-2412019/HUDDCPHI01087	\$2,470,500	DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE DC	WASHINGTON, DC
MCKNEW CHIPPING, INC.	BRANDYWINE	MD	20613-8867INP13PD02164/INP11PX30620	\$20,000	DEPARTMENT OF JUSTICE, DEPARTMENT OF COMMERCE, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE AGRICULTURE, DEPARTMENT OF HOMELAND SECURITY, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE VA	WASHINGTON, DC
MCMULLEN ROOFING, INC.	PHILADELPHIA	PA	19124-5663DJBPO204M6210001	\$1,297,235	DEPARTMENT OF JUSTICE, DEPARTMENT OF COMMERCE, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE AGRICULTURE, DEPARTMENT OF HOMELAND SECURITY, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE VA	FAIRTON, NJ
MCP COMPUTER PRODUCTS INC	SAN MARCOS	CA	92069- DOCEA133C13NC0804/GS35F0889N	\$8,913	DEPARTMENT OF COMMERCE, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE AGRICULTURE, DEPARTMENT OF HOMELAND SECURITY, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE VA	SILVER SPRING, MD
MCQUADE AND BANNIGAN, INC.	UTICA	NY	13502-4448INP13PD00472/GS06F0072S	\$15,041	DEPARTMENT OF COMMERCE, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE AGRICULTURE, DEPARTMENT OF HOMELAND SECURITY, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE VA	JERSEY CITY, NJ
MEAD JOHNSON & COMPANY, LLC	EVANSVILLE	IN	47712-5095AGDPROP130048	\$9,887	DEPARTMENT OF COMMERCE, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE AGRICULTURE, DEPARTMENT OF HOMELAND SECURITY, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE VA	MOUNT VERNON, IN
MEAD JOHNSON & COMPANY, LLC	EVANSVILLE	IN	47712-5095HSFE9013P0003	\$2,913,029	DEPARTMENT OF COMMERCE, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE AGRICULTURE, DEPARTMENT OF HOMELAND SECURITY, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE VA	NEW YORK, NY
MEDITERRANEAN CEMENT CO, INC	KEY BISCAYNE	FL	33149-1437INF13PX02363	\$137,345	DEPARTMENT OF COMMERCE, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE AGRICULTURE, DEPARTMENT OF HOMELAND SECURITY, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE VA	VIRGINIA BEACH, VA
MEDTRONIC NAVIGATION, INC.	LOUISVILLE	CO	80027-9710VA24313P0764	\$35,530	DEPARTMENT OF COMMERCE, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE AGRICULTURE, DEPARTMENT OF HOMELAND SECURITY, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE VA	LOUISVILLE, CO
MEDTRONIC SOFAMOR DANEK USA, INC.	MEMPHIS	TN	38132-1719VA24313C0089	\$75,500	DEPARTMENT OF COMMERCE, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE AGRICULTURE, DEPARTMENT OF HOMELAND SECURITY, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE VA	BROOKLYN, NY
MEDTRONIC, INC.	MINNEAPOLIS	MN	55432-5604VA24313P1888	\$5,000	DEPARTMENT OF COMMERCE, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE AGRICULTURE, DEPARTMENT OF HOMELAND SECURITY, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE VA	PORTSMOUTH, NH
MESOTECH INTERNATIONAL, INC.	SACRAMENTO	CA	95826-9716DOCEA133C13SU0767	\$27,707	DEPARTMENT OF COMMERCE, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE AGRICULTURE, DEPARTMENT OF HOMELAND SECURITY, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE VA	SACRAMENTO, CA
METEOROLOGICAL DATA SERVICES, LLC	SAN DIEGO	CA	92111-5513DOCAB133W11CN0056	\$732	DEPARTMENT OF COMMERCE, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE AGRICULTURE, DEPARTMENT OF HOMELAND SECURITY, DEPARTMENT OF INTERIOR, DEPARTMENT OF THE VA	SAN DIEGO, CA

Table 6. Various contracts awarded during Hurricane Sandy recovery (from Federal Transparency.Gov website)

E. FUNDING

The Robert T. Stafford Disaster Relief and Emergency Assistance Act regulates federal funding for disaster relief. This Act, which is essentially the 1974 Disaster Relief Act with a number of added Amendments states that:

(1) federal assistance supplements state and local relief and recovery efforts and, (2) is triggered only by a presidential declaration that is preceded by a gubernatorial request for assistance. (7)

While the federal government is supposed to “supplement” state and local recovery efforts, the reality is that for significant disasters the cost of recovery is immense and state and local funds are woefully short of requirements. For the preparation stage and immediate response of Hurricane Sandy, FEMA and other organizations utilized existing funds, knowing that additional appropriations would be forthcoming.

On December 7, 2012 President Obama requested \$61 billion to support Hurricane Sandy recovery efforts. On December 28th the senate passed H.R. 1 in the amount of \$61 billion, the House then passed H.R. 41 on January 4, 2013 and finally H.R. 152, which ultimately appropriated \$60.4 billion for Hurricane Sandy recovery efforts. The resolution was entered into law as Public Law 113–2, H.R. 152, 127 Stat 4 and was signed by the president on January 29, 2013. The law contained two parts; Division A: Disaster Relief Appropriations Act 2013 and Division B: Sandy Recovery Improvement Act of 2013 (Wikipedia).

The financial burden for the Hurricane Sandy recovery has been staggering. One year after Sandy, FEMA had spent \$1.4 billion on individual assistance to 182,000 survivors, \$2.4 billion in Small Business loans, \$7.9 billion in National Flood Insurance Program (NFIP) payments and \$3.2 billion in recovery contracts for debris removal, infrastructure rebuilding and other emergency work (FEMA). And this is just for FEMA; there are many other organizations with Sandy bills to pay. Table 8, from Recovery Accountability and Transparency Board for Hurricane Sandy Funding, breaks down the appropriations by federal agency and accounts for the effects of sequestration. Note that

the total does not equal the \$60.4B in H.R. 152 due to the NFIP and other smaller funding actions not being included in the chart.

Agency	Total Appropriation	Adjusted Appropriation
<i>Department of Agriculture</i>	\$228,400,000	\$216,980,000
<i>Department of Commerce</i>	\$186,000,000	\$309,700,000
<i>Department of Defense</i>	\$112,570,000	\$109,473,000
<i>Department of Health and Human Services</i>	\$800,000,000	\$759,750,000
<i>Department of Homeland Security</i>	\$12,071,908,000	\$11,468,312,600
<i>Department of Housing and Urban Development</i>	\$16,000,000,000	\$15,200,000,000
<i>Department of Justice</i>	\$21,250,000	\$20,022,188
<i>Department of Labor</i>	\$25,000,000	\$23,747,000
<i>Department of the Interior</i>	\$761,000,000	\$786,718,396
<i>Department of Transportation</i>	\$13,070,000,000	\$12,416,500,000
<i>Department of Veteran Affairs</i>	\$235,631,000	\$235,631,000
<i>Environmental Protection Agency</i>	\$607,725,000	\$577,338,750
<i>General Services Administration</i>	\$7,000,000	\$6,650,000
<i>Legal Services Corporation</i>	\$1,000,000	\$950,000
<i>National Aeronautics and Space Administration</i>	\$15,000,000	\$14,250,000
<i>Small Business Administration</i>	\$800,000,000	\$764,750,000
<i>Smithsonian Institute</i>	\$2,000,000	\$1,900,000
<i>Social Security Administration</i>	\$2,000,000	\$2,000,000
<i>U.S. Army Corps of Engineers</i>	\$5,430,000,000	\$5,081,084,941
Total	\$50,376,484,000	\$47,995,757,875

Table 7. Hurricane Sandy recovery; appropriations by federal agency
(from Recovery Accountability and Transparency Board website)

There has been a significant amount of scrutiny regarding President Obama's \$60.4 billion dollar Sandy aid package—and rightly so. This is a staggering amount of money and some of it seems to be targeted at areas that are not directly supporting the recovery of Hurricane Sandy victims. Approximately \$28 billion of the aid package is for long-term disaster mitigation projects along the eastern seaboard (Table 9) (Myer 4). This delves into an area that needs a much more planned and coordinated response from states and the federal government. Future disaster mitigation and prevention is not the intent of disaster relief funding under the Stafford Act. Instead, these projects should be budgeted for and debated like any other items that the federal government wants to spend taxpayer's dollars on.

Other portions of the funding bill are also questionable. \$200 million of the bill is for the U.S. Department of Health and Human Services and is “to be used at the discretion of the Secretary” (Myer 5). This type of “open checkbook” funding is just bad government and it does not show the American people that the government respects their tax dollars. The Obama administration also has a \$7 billion supplemental request for Sandy aid, which includes \$50 million for dislocated worker training. This nebulous “worker training” term is used frequently for hazy and unfocused spending initiatives and it would be interesting to see a detailed breakdown of exactly what training and for whom would be covered by that \$50 million.

TABLE 1

Obama's Request for Future Disaster Programs on East Coast Costs \$28 Billion

Department/Agency	Request	Details
Agriculture	\$30,000,000	Mitigate future flood risks
Commerce	\$20,000,000	Evaluate future impact issues
Homeland Security	\$3,249,000	Erosion control
Housing and Urban Development	\$15,000,000,000	Community Development Block Grants
Small Business Administration	\$20,000,000	New initiatives
Various Entities	\$12,970,000,000	Mitigation projects
Total	\$28,043,249,000	

Source: Jeffrey D. Zients, Deputy Director for Management, Office of Management and Budget, letter to House Speaker John Boehner, December 7, 2012, http://www.whitehouse.gov/sites/default/files/supplemental_december_7_2012_hurricane_sandy_funding_needs.pdf (accessed December 13, 2012).

IB 3803  heritage.org

Table 8. Hurricane Sandy relief dollars being spent on future mitigation plans and projects (from Heritage.Org 15)

State and local governments have also been significantly burdened by Sandy recovery efforts. While a detailed analysis of these agencies is beyond the scope of this chapter, Figure 21 below depicts just overtime spending by New York City from October 29 to December 24, 2012. The \$154 million price tag is small potatoes compared to the federal appropriations but it is a good example of the burden placed on local governments during disaster recovery.

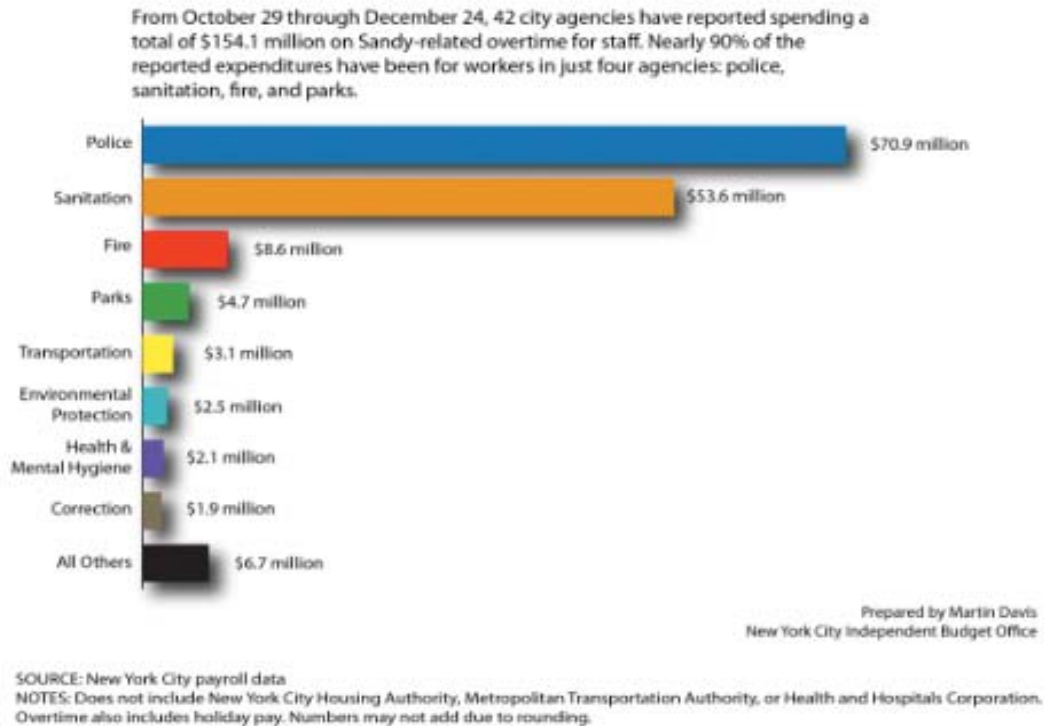


Figure 20. New York City; Hurricane Sandy overtime costs Oct 29–Dec 24 2012
(from New York City Budget Office website)

F. ANALYSIS OF RESPONSE AND CONTINGENCY CONTRACTING

When it comes to responding to disasters as large as Hurricane Sandy, the plain truth is that there will **NEVER** be a response that meets the immediate needs of everyone affected and satisfies all citizens and the media. A couple of weeks after Sandy struck, on November 12, 2012, “Hurricane Sandy; Katrina on the Hudson” by Mary Katherine Ham was posted on the HotAir.com website. The article is critical of the Sandy response and states in part:

It took days for FEMA to hit the ground in hard-hit parts of NYC. More than a week after the storm, FEMA representatives were just getting on the ground and opening temporary offices in New Jersey. When a nor’easter blew in, several of their offices shut down because of—wait for it—severe weather. (Morrissey)

No doubt the response could have been better in some areas but I contend that the response to Hurricane Sandy, the overall effort to include DOD and contracting efforts,

was improved over the Hurricane Katrina response. The Sandy response also shows that the government, FEMA and other organizations **CAN** learn and make positive changes.

As we look back on Hurricane Sandy and the preparations and recovery, there are many positives that emerge:

- DLA exercising existing fuel delivery contracts prior to the storms arrival allowed fuel trucks to be in place when the call went out for fuel
- Use of the DOD dual-status commander, while not an overall success the concept was exercised and it validated the utility and value of the concept
- USACE use of their Advanced Contracting Initiative contracts greatly assisted with rapid debris removal, de-watering operations, and general contracting
- FEMA and H&HS use of pre-existing contracts for ambulances and food
- FEMA properly prepositioned personnel and equipment in targeted areas
- Pre-storm presidential emergency declarations expedited recovery efforts, rapid major disaster area declarations followed quickly
- First effective use of the Post-Katrina “Surge Capacity Force” by DHS, allowed for rapid call up of trained personnel in key support areas
- Coordinating an energy restoration task force resulted in a more coordinated effort between utility companies to restore power
- Effective use of WebEOC (Emergency Operations Center), a web based crisis management system that enhances coordination efforts by having a “common operating picture” that all agencies can view and interact with (Federal Emergency Management Agency)
- New York City effectively utilized a robust communications plan using their website, YouTube, mobile, text messages, e-mails, Twitter, telephone hotlines, and FaceBook (Federal Emergency Management Agency)
- Use of technology; smartphone Apps from the American Red Cross and FEMA proved to be very useful during preparations and recovery. The Red Cross App was downloaded over 100,000 times (Federal Emergency Management Agency)

These are all very positive events and actions and many of them, such as the DHS “Surge Capacity Force” are a direct result of lessons learned from Hurricane Katrina. Another clear success story was the number of organizations with pre-existing contingency contracts in place. In the Post Katrina Emergency Management Reform Act of 2006 one of the items they addressed was the lack of pre-existing contracts for

recovery operations. The Army Corps of Engineers leads the pack in this area with their ACI program but many other organizations at local, state and federal levels have followed suit and it showed during Hurricane Sandy.

On the other side of the coin, there are the failures of Hurricane Sandy's preparations and response. The list below highlights several areas that were weak points. Some are new issues, but most are recurring themes, unfortunately:

- Integrating senior leadership guidance and communications into the response. With multiple senior leaders from the president on down, there were times when leadership decisions were not communicated to the entire recovery team, causing confusion and lack of efficiency
- Poor training of Recovery Support Function field coordinators. The coordinators knew little of the National Response Framework (NRF) and operated in a stove-piped fashion, unaware of their place in the broader picture of response
- Inefficient FEMA mission assignment process. FEMA's process to formally assign tasks to other federal agencies is cumbersome and slow. In many cases the "order" took over a day just to process, unacceptable during disaster response operations
- Poor use of deliberate hurricane response planning that already existed prior to Sandy. A survey found that 64% of FEMA's deployed personnel had never used or had access to existing regional hurricane response plans—a clear failure in leadership, information management and dissemination
- Lack of training for Community Relations specialists. These people are the "face" of FEMA in the field and over 1,700 were deployed. About 70% were new to the assignment and many had only received three hours of training
- Poor overall communications plan.
- Lack of communication regarding FEMA programs and processes *prior* to the disaster occurring
- Untrained FEMA field workers who did not know what to communicate to survivors during the immediate response and first contact
- Poor communication during the long term response when people were applying for FEMA assistance; failure to provide detailed and accurate information on programs and processes
- Failure to consider that many survivors will be without power for a long period of time. Many survivors were told to check FEMA's website or call

their hotlines for information but after a day or so batteries for computers and phones were dead, leaving many of the worst off with no way of getting information and help

- The lack of a multi-state National Guard response framework and overall lack of maturity in the dual-status commander process prevented it from being more effective
- Funding for Sandy relief efforts was overly aggressive and failed to remain focused on the immediate needs of survivors and rebuilding communities. Long term funding for infrastructure changes to adapt to climate change need to be debated in congress and budgeted for
- The failure to evacuate more people from areas that were clearly going to be heavily damaged. NYC's Zone A was identified early on as a potential danger area for flooding and storm surge damage and when the evacuation order was given, very few heeded the warning. More effort must be placed into enforcing evacuation orders and convincing citizens it is the right course of action.

For **contingency contracting specifically**, the overall picture of the Hurricane Sandy response favors the positive. After extensive reviews of Hurricane Sandy after action reviews, websites, newspaper articles and government documents one is hard pressed to find any that highlight **contracting** as a significant area of failure during the response. FEMA's after action hardly mentions contracting as a concern while New York City's does mention the need to establish existing contingency contracts for areas such as boiler repair/plumbing, the need to add generator maintenance and GPS tracking to generator contracts and the desire to enter into their own debris removal contracts vice relying on the USACE. Additionally, there are hundreds of articles and reports from independent sources on Hurricane Sandy but very few discuss contracting at all and even less identifies contracting failures as significant issues.

The USACE does make considerable mention of their Advanced Contracting Initiative (ACI) in their After Action report and lists it as one of their top three items of interest. The ACI allows the USACE to enter into contracts for typical recovery type services and commodities such as power, water, debris removal and roofing repair. The ACI program has been very successful since its inception in 1999 and highlights one of the most significant focal areas of disaster response and that is *timeliness of response*. With the ACI contracts already in place, delays are minimized and support is more

responsive. The USACE Sandy After Action makes several recommendations and comments regarding ACI:

- ACI contracts are not long term solutions, only short term
- Seek to transition from ACI contracts to local business contracts as soon as possible
- Allow ten days for USACE contractor personnel turnover to ensure incoming personnel have adequate knowledge
- Encourage the use of emerging technologies in ACI contracts
- New ACI contracts will have two wage rates; metropolitan and other.

With the success of the USACE ACI program and the other successes seen by DLA with standing fuel contracts and DOT with standing ambulance contracts, it seems very apparent that there is a steady shift toward response agencies maintaining standing response contracts instead of just waiting for the disaster to occur and then starting the process.

G. LESSONS LEARNED AND RECOMMENDATIONS

After action reports, agency briefs, and scholarly articles are filled with lessons learned and recommendations for the post Hurricane Sandy world—an entire book could be written on the subject. Below are the lessons learned and recommendations that I believe are most important and relevant from Sandy:

- FEMA still has not learned to focus enough on the survivor during the early stages of recovery. The emotional trauma and shock of victims is significant, FEMA needs to get more trained personnel into the affected areas as soon as it is safe to do so. FEMA personnel should not arrive without food, water, and *clear information and instructions* for the survivors
- FEMA needs to create a new four tiered communications plan:
- In the preparations stage of a disaster, FEMA needs to push information to people regarding what policies and programs will apply in the aftermath and how they function. Use EVERY available and modern communications means possible
- During the initial recovery stage of the disaster put people in the field who understand survivors immediate needs and *know what they are talking about regarding FEMA's support plan*






- During the long term recovery phase when people are applying for assistance, FEMA must articulate to them how FEMA programs work and interact with other recovery programs (such as private insurance and state run programs)
- Follow up and communicate with people who have applied for assistance. Recordings do not cut it, it may mean long wait times but survivors need a voice on the other end to talk to for something as serious as recovering from a major disaster
- Prepositioning of critical recovery items works, continue to expand these efforts. History has shown that food, water, blankets, temporary shelters, generators, fuel, and medical supplies will all be needed in great quantities. Caution; committing to prepositioning areas when the storm track is still questionable can be disastrous
- The USACE, DLA, H&HS and New York all got it right with their pre-existing contingency contracts for services and commodities. All federal, state and local agencies should consider these types of contracts and relationships with businesses to minimize delay the preparations and response phases
- In urban areas such as New York City and Boston, high numbers of skilled technicians such as plumbers and electricians will be needed. Because of large numbers of housing units and high capacity buildings, a single failure could mean 400 residents are homeless. Establish standing contingency contracts for critical technicians
- Use technology to the greatest extent possible, especially for mass communication and coordinating response efforts. New York City's communication plan was exceptional and effective. WebEOC proved to be effective for FEMA as a coordination tool with supporting agencies. The use of smartphone Apps was a first during a disaster response and also proved to be effective and highly utilized. As technologies become more advanced, fund and implement them into standing response plans
- In areas prone to flooding or when flooding is anticipated, consider standing contingency contracts for towing and vehicle removal services. New York City was unprepared for the number of derelict vehicles and wayward boats that blocked streets and hindered first responders and logistics movements
- The Rapid Repairs and Sheltering and Temporary Essential Power programs are good programs and the concept of getting residents back into their houses vice in hotels and temporary shelters is a great one. In high risk areas, states and large cities should enter into contingency contracts with general contractors to facilitate repair work beginning immediately after a disaster

- The DOD “dual-status commander” concept is sound and needs to be exercised further to refine it and make it more effective. DOD, DHS and state governors need to continue to devote resources to this effort to make it work. The unity of command problem has been a post-disaster after action item for too long and the dual status commander will help eliminate this
- More realistic and coordinated DOD/DHS/multi-state training is needed. The U.S. currently has a National Exercise Program (NEP) that is managed by FEMA. Biennial training cycles already exist, we must get more realistic and focused training accomplished to decrease actual response times and minimize the friction that occurs at the seams of participating organizations
- Title 10 (active duty) military forces will remain focused on fighting and winning against our adversaries; this will not change. Title 32 forces (National Guard) must accept a certain level of mission shift that ensures they are the force of choice for DOD responses to natural disasters. Training and funding must accompany this shift to ensure the National Guard is prepared to respond

At the macro level, something else that must be considered too is FEMA's overall role in disaster response. Over the last thirty years there has been a dramatic and alarming trend toward “big government” FEMA responses to natural disasters.

CHART 1

Total FEMA Disaster Declarations by Administration

President	Total	Yearly Average	
Ronald Reagan	224	28.0	
George H. W. Bush	174	43.5	
William J. Clinton	716	89.5	
George W. Bush	1,037	129.6	
Barack Obama	654*	139.3	

* As of September 30, 2013.

Source: Federal Emergency Management Agency, "Disaster Declarations," <http://www.fema.gov/disasters> (accessed September 30, 2013).

SR 144  heritage.org

Figure 21. FEMA disaster declarations by recent presidents (from Heritage.Org 11)

Figure 22 from the Heritage Foundation depicts the number of FEMA Disaster Declarations by president going back to Ronald Reagan. This trend upwards is alarming, costly and clearly shows the federal government "takeover" of funding disaster responses. We simply cannot afford to continue the trend that is ongoing.

The Stafford Act mandates that FEMA pay for 75 to 100 percent of disaster response bills as long as FEMA has issued a disaster declaration. Meeting the requirements for a declaration is fairly simple, the disaster must be "of such severity and magnitude that effective response is beyond the capabilities of the state and the affected

local governments and that Federal assistance is necessary” (Mayer 5). The financial threshold for determining if FEMA funds are authorized is if a storm’s storm related damages reach \$1.29 per capita—then it meets the criteria. For some states, this is less than \$1 million in damages. That is far too low and only encourages governors to seek federal funds and not budget for state disaster relief efforts themselves.

One idea is to increase the damage per capita amount by two to three times.....or possibly much more. This would encourage states to budget for disaster relief and push the responsibility for all but the worst disasters back to the state level. The fact is that neither New Jersey nor New York had a disaster relief fund prior to Hurricane Sandy and that clearly shows how reliant states have become on FEMA and the federal government to bail them out of every type of disaster scenario. Another side benefit of this would be that FEMA would not spend as much time responding to disasters and they could focus on training and equipping for the very worst-case scenarios vice lower level disasters.

H. CHAPTER SUMMARY

After Hurricane Katrina a slew of new legislation was passed in an effort to better prepare the nation for another catastrophic event. The Post Katrina Emergency Management Reform Act of 2006 was one of the more significant pieces of legislation and it addressed the formation of a “Contingency Contracting Corps,” changes to “pass thru” amounts for sub-contractors and several other contracting centric issues. The FY 2007 John Warner National Defense Act clarified the use of National Guard troops during natural disasters and provided the Secretary of Defense with additional powers to assist during disasters and there were also amendments to the Stafford Act which expanded the federal government’s disaster assistance authority. Hurricane Sandy’s response proved that some of these pieces of legislation created positive changes while others were not as effective (Bea et al. 56).

In the aftermath of Sandy changes to disaster response laws and policies are also taking place. The nation’s overarching response plan, the National Response Framework (NRF) was overhauled and a new version signed in May 2013 (Federal Emergency Management Agency). The new NRF incorporated many lessons learned from Sandy to

include a greater emphasis on the “whole community” concept during recoveries, clarifies the role Emergency Support Functions (ESFs), and clarifies the federal role during non-Stafford Act incidents and recovery operations. The unpopular (with coastal homeowners) Biggert-Waters act was passed in the summer of 2013 that greatly increased the rates for flood insurance in areas that were very high risk and previously subsidized by the federal government.

At the DOD level, real post-Sandy policy changes are still being staffed and developed but a Government Accountability Office (GAO) report from September 2013 titled “Civil Support” identified command and control during multistate civil support incidents and establishing a specific set of DOD capabilities that could be provided during disaster preparation and response as the two main weaknesses that have plagued DOD support during the National Level Exercise in 2011, Hurricane Sandy and the Boston Marathon bombing.

In summary, Hurricane Sandy was a colossal storm that caused some of the worst damage ever seen by a hurricane within the United States. The response to Sandy was impressive in both scope and magnitude, showing that FEMA and other agencies had learned from past failures in some areas and made positive changes to address the problems. While not without failures and weakness in many areas, the overall response was effective, particularly when considering how large the affected area was. The standing contingency contracts that were executed by FEMA, DLA, and the USACE showed a commitment to being contractually prepared and quickly responding to disaster recovery efforts. At the local level in New York City, Boston and other areas, the contracting preparations made by cities showed that standing contingency contracts had become part of their disaster relief plans also.

At the DOD level, Hurricane Sandy revealed slow progress in establishing better unity of command and cooperation between all components of the DOD; active, reserve and National Guard. The challenge with getting DOD to invest substantial resources and energy into policy, structure, and training to support disaster response is that the mission is simply not a top priority and it will remain that way unless there is significant top down pressure. This is not likely in my opinion as we push forward into the second

decade of our war against religious extremists and we also begin to focus on Asia and the Pacific region. It simply comes down to resources and priorities for the military and CONUS disaster relief will never be amongst the top priorities for the Title 10 armed forces of the United States of America.

Hurricane Sandy's response showed that progress has been made in many areas but there is still plenty of room for improvement.

VI. CONCLUSIONS AND RECOMMENDATIONS

Our Joint Applied Project team picked the subject of contingency contracting in support of CONUS disasters because we knew that much has evolved over the last two decades with respect to disaster response and contingency contracting. Additionally, the three disasters we selected are all well documented and have aspects that are highly debated, emotional and controversial. For these reasons we thought the subject would be interesting and rewarding to research, analyze and write about. We were not disappointed.

As we conclude this project, let us first answer the question of contingency contracting support during the three disasters we studied and analyzed; were the contracting efforts timely, sufficient and effective for dealing with the challenges of the recovery phase they were intended to address? Like many complex issues, the answer is yes and no. There were areas of clear success such as the U.S. Army Corps of Engineers Advance Contracting Initiative (ACI), a standing contingency contract that the USACE maintains to deal with things such as debris removal and proved to be extremely responsive and effective, especially during Hurricanes Katrina and Sandy. On the other hand are numerous failures that occurred such as in New Orleans during Hurricane Katrina where evacuation plans failed to account for a large population of elderly and disabled personnel and communications between federal, state and local agencies was dismal at best.

What is heartening to see is that there does appear to be a “learning curve” when it comes to disaster response in the United States and contingency contracting in support of the recovery efforts. In the aftermath of each of the disasters we analyzed significant local, state and federal analysis of the events took place and it generally resulted in positive changes to policies, laws and regulations.

Of the three disasters we analyzed, the Northridge earthquake response was clearly the most effective and well executed. FEMA’s response time and coordination efforts with local agencies such as CALTRANS and the FHWA were commendable and

since much of the recovery focus was on restoring transportation corridors and systems, the focus and level of effort placed in these areas seemed appropriate and achieved rapid success. Power and utility restoration was also crucial during the Northridge recovery and as stated in our Northridge chapter, most people in the affected areas had power restored within three days of the earthquake taking place. Compare this to the power restoration timelines for Katrina and Sandy, which in some cases took months to restore, and you will see that the Northridge recovery was very well executed and coordinated.

Another area that was significant during Northridge was that of debris removal. With so many highways and overpasses destroyed, there were literally millions of tons of rubble that had to be put into trucks and hauled away to appropriate landfills and other locations. This effort could have significantly slowed down the recovery timeline but FEMA and state agencies quickly let “unit price” contracts for debris removal, along with USACE debris removal contracts and quickly got the debris removal issue under control. Unit price contracts (per cubic yard) have long been considered the most cost efficient contracting vehicle for disaster recovery debris removal. In the case of Northridge, over 7 million cubic yards of debris was removed and as is the case with most disaster recoveries, debris removal was one of the most significant costs incurred by FEMA and state agencies.

One interesting and significant federal policy change that occurred during the recovery of Northridge was that of rebuilding infrastructure to higher and more expensive standards than what had been in existence and destroyed by the earthquake. Previous to Northridge, the federal policy was to rebuild roadways and bridges to the standard and level of quality that previously existed. However, President Clinton changed that and at significant cost to federal tax-payers, had California’s transportation infrastructure rebuilt to more earthquake resistant standards that significantly enhanced the structural soundness of all the rebuilt roads, bridges and overpasses. Whether or not the increased costs for this should have been born by federal taxpayers versus the state of California are debatable. Nevertheless, it set a new standard for earthquake recovery and rebuilding and make California’s roadways more prepared to handle the next big earthquake that happens in that region.

Hurricane Katrina presented an immense challenge to FEMA and every other federal, state and local agency involved in the recovery efforts. Unlike the Northridge earthquake which lasted for 45 seconds and had a more focused level of destruction, Katrina pounded the southern coast for hours and brought flooding, wind damage, power loss and property destruction to a huge swath of territory, although the worst of the storm's damage was centered around New Orleans. New Orleans unfortunately was largely below sea level and was protected by a fragile system of levees and dykes that proved to be incapable of holding back the surging waters that Katrina delivered.

Another aspect of Katrina that is often overlooked and not discussed is that the area affected is largely a lower income and less affluent areas than the Los Angeles area that was affected by the Northridge earthquake. One has to wonder if a regions socio-economic status has any bearing on disaster response, perhaps a good subject for a future Naval Postgraduate School Joint Applied Project.

FEMA's response to Katrina has been one of the most well document subjects in recent history when it comes to natural disasters in the United States. One of the more interesting aspects of Hurricane Katrina is that just a year before the hurricane struck, an exercise was conducted for a notional hurricane (Hurricane Pam) with a goal of exercising the response to a destructive hurricane in the Louisiana area. The Hurricane Pam exercise had limited participation and certainly not all the key players were present, particularly DOD who would later play a huge role during the immediate aftermath of Katrina. However, the exercise was a step in the right direction toward better preparedness but showed how challenging it is to get all the disparate organizations together for "only" an exercise and how hard it is to push lessons learned to organizations such as DOD who have fighting wars as their primary mission, not CONUS disaster recovery.

The failures of contracting during Katrina are numerous. About the only thing that seemed to go right were the USACE debris removal plans and use of their Advanced Contracting Initiative (ACI) where they already had standing contingency contracts with regional companies for debris removal services. These contracts could be activated quickly and prevented the need for hasty "no bid" contracts with associated inflated

prices for much of the debris removal services that were needed. Aside from the ACI successes, one has to look long and hard to find similar success stories when it comes to contracting. Inflated cost no-bid contracts were used by FEMA repeatedly during the Katrina recovery due to the lack of relevant standing contingency contracts for items such as food, water, shelter and even body recovery. The body recovery subject was an emotional issue where for days the state battled with the federal government over who was responsible for removing bodies in the aftermath of Katrina. In the end the state was forced to contract with a private company for their removal but the fact that this issue was delayed for days as bloated corpses floated in the water around New Orleans highlight the fact that preparations for a serious hurricane recovery in the region had never really been thought through by anyone.

There were several noteworthy policy and regulation changes made during the aftermath of Katrina. In direct response to the inordinate number of hasty and costly no-bid contracts, a new limit of 150 days on no-bid contracts was imposed by the federal government.

The most significant policy change was the Post Hurricane Katrina Reform Act of 2006. This Act significantly reorganized FEMA, expanded their statutory authority, and mandated new requirements on the agency. The Act also created what is known as the “Surge Capacity Force” in response to a lack of qualified manpower for FEMA to pull from during the Katrina recovery. This concept is a sound one since only so many full time FEMA employees are on staff at any given time, the surge force allows FEMA to reach out to other government organizations and pull qualified personnel to build up the FEMA disaster response workforce for a specific response and duration of time. This is sound and common sense policy and it was put to good use during the Hurricane Sandy response a few years later.

Two other noteworthy issues that were part of the 2006 Act were the FEMA Strategic Human Capital Plan and enhanced training opportunities for Contingency Contracting officers and other disaster response personnel. The Strategic Human Capital Plan was designed to recruit and retain the best and brightest into FEMA and to ensure that analysis was done to determine what types of personnel were needed. While this

might sound like an intrinsic requirement for any organization, apparently at FEMA this type of manpower planning was not present so the Strategic Human Capital plan created and formalized it. The enhanced training opportunities created under the Act allowed for funding to better train FEMA personnel, Contingency Contracting Officers, and others such as those who would be part of the Surge Capacity Force.

Hurricane Sandy in 2012, like Katrina, was an immense storm that left incredible devastation in its wake. However, the response to Sandy was improved over that of Katrina and while not without significant issues, did show that FEMA had learned and adapted in the years since Katrina.

The concept of the Surge Capacity Force, developed in the aftermath of Katrina was first used during Hurricane Sandy's recovery and while not perfect, did allow FEMA to augment its core workforce with personnel (some qualified, some not) to assist with Sandy recovery operations. The Surge Capacity Force is a step in the right direction and with further refinement and use, will prove to be an invaluable part of FEMA's overall manpower plans.

Other noteworthy successes during Sandy's recovery were FEMA's Rapid Repairs and Sheltering program and New York City's Temporary Essential Power Program. Both programs sought to get families displaced from their residences by storm damage back into their homes as quickly as possible by conducting some minimal repairs to their properties to restore essential utilities such as power, water and plumbing. The programs were generated with the intent to reduce the number of homeless personnel that FEMA had to shelter and a side benefit would be keeping people and in their communities where they could help others and assist with local rebuilding efforts. These programs were already contracted for by FEMA and NYC (carpenters, plumbers, electricians etc.) so when they were put into action, the costs were already negotiated and the qualifications of the vendors were already verified—a significant factor since there are many instances of unscrupulous and non-certified contractors showing up in storm ravaged areas and taking advantage of citizens in dire need of home repairs.

The DOD played a significant role during the Hurricane Sandy response and it was the first time that the concept of the “dual-status” commander was exercised. This concept was created several years prior with the goal of a more unified command structure for all military personnel who were supporting a CONUS disaster recovery event. Often unknown by the general public but National Guard troops from individual states are “owned” by the state’s governor and operate under a USC Title 32 status. Active duty federal troops are “owned” by the President and Secretary of Defense and operate under a USC Title 10 status. This creates confusion and lack of unity of command when both types of troops are present during a recovery—which history has shown they normally are. The dual-status commander is a specially trained and authorized National Guard or active duty officer who can legally be in charge of both Title 10 and 32 troops. This concept is a great idea and was exercised during Sandy with some success. With more national level training events and use during real world disaster responses, the dual-status commander concept will gain acceptance throughout the DOD and National Guard units and will greatly enhance the coordination of the overall military response during CONUS disaster recoveries.

One significant failure during FEMA’s response during Sandy was their communications plan with the survivors of the hurricane. FEMA just did not effectively communicate information regarding FEMA programs, how to apply for them, what the details were and all the nuances that go with any federal process. Survivors were left frustrated and furious, unable to reach FEMA personnel or just getting recording that said they “did not qualify” for a specific program. FEMA has got to do much better than this with an emphasis on getting information pushed out to a potentially affected area several days prior to a storm arriving. Sandy and Katrina were forecast incredibly accurately, with that capability potentially affected personnel should be reading about FEMA programs and processes as the storm approaches, not in the aftermath when power is out and computers and smartphones batteries go dead and there is no time to read up on the programs—and other more urgent priorities emerge.

Like Katrina, Sandy spawned several significant policy changes in her aftermath. The National Response Framework (NRF) was re-written with a greater emphasis on the

“whole community” concept during disaster recovery. This concept seeks to better coordinate all resources, both public and private, and bring them to bear in concert vice having them be separate efforts. This too is a step in the right direction and with further refinement and use, will enhance the overall response efforts put forth during future disaster responses. The highly contentious Biggert-Waters Act was passed in the summer of 2013 and significantly increased the insurance costs of coastal homeowners who live in flood prone areas and have a higher likely hood of storm damage and flooding during nor’easters and hurricanes. This legislation just makes sense given the immense cost of coastal rebuilding and the knowledge we have of current and foreseeable future weather patterns. Coastal homeowners are simply going to have to bear more of the burden for preparation and recovery costs in areas they choose to live and build in that are clearly higher risk than more inland areas.

Based on our analysis of these three disasters and the responses for each, we make the following recommendations to make disaster response plans and policies more efficient at the federal, state and local levels:

- The use of standing contingency contracts is *essential* for timely and effective disaster response. The chaos and stress of disaster recovery is no time to negotiate a contract for critical services. The results are usually no-bid contracts that are far too costly and might not deliver the desired results. All essential services such as debris removal, construction, water, food and sanitation all need to be on contract and ready for execution. The USACE ACI for debris removal stands as a model of efficiency when it comes to this area.
- When entering into standing contingency contracts, the use of local businesses is mandated by the Stafford Act to a certain extent and just makes sense otherwise. A note of caution however since the local businesses on contract to supply services might also be affected by the natural disaster and be unable to comply with their contract. Consideration should given to having both local and out of state contracts to ensure that *someone* will be available to provide critical services when needed.
- Restoration of utilities and *getting people back into their homes as soon as possible* should be a goal during all recoveries. The Sheltering and Temporary Essential Power (STEP) program operated during Hurricane Sandy’s recovery was effective at minimizing the number of homeless personnel FEMA had to deal with and it kept people in their local

communities; their comfort zones where they could do the most good for others.

- The military dual-status commander concept is sound and should continue to be exercised during national level exercises and future real-world disaster recoveries. A coordinated military response is essential to all large- scale recoveries and *unity of command is the first step to ensuring that*. All military troops, both National Guard and active duty must fall under one command structure to achieve peak efficiency.
- National level exercises must continue to be funded and supported by the President, congress, DOD, FEMA etc. With funding, leadership and planning, national level disaster response exercises can be effective at building relationships between supporting agencies, exposing weaknesses in plans, and maintaining a core of experienced personnel in all agencies expected to take part in real-world disaster recoveries.
- FEMA must have a more robust and effective communication plan in place *prior to a hurricane striking*. Potentially affected personnel must be pushed information via television, the Internet, Smart Phone apps, telephone recordings and whatever else might work. Persons in potentially affected areas should have a working knowledge of what to expect from FEMA during the recovery phase to include where shelters will be, where FEMA locations will be, what FEMA programs exist and how to apply for them in the event their property is destroyed, where medical facilities will be and who to contact regarding utilities outages. FEMA should expect power outages and loss of Internet access and dead batteries in computers and smart phones for citizens in affected areas. Electronic communications will not be very effective during the initial response phase when power is out.
- The FEMA Surge Capacity Force developed post Hurricane Katrina was exercised with some success during the Hurricane Sandy recovery and should continue to be exercised during national level exercises and real-world disaster response. This construct of maintaining a core of qualified personnel who are then augmented by the Surge Capacity Force seems to be the only logical and fiscally possible way to augment the FEMA team with trained and competent personnel during a disaster response.
- Funding for DOD and other federal Contracting Officers training must continue to be budgeted for. This will take leadership and planning from many government organizations but the payoff will be substantial during routine contracting actions and contingency type contracting actions that take place during disaster response. Government contracting is a complex world that is heavily regulated. It will take significant training to ensure Contracting Officers who are authorized to bind the U.S. Government and spend taxpayer's dollars are doing so within the laws and policies in existence.

- Areas that are likely to be struck by natural disasters need to have up to date and efficient evacuation plans in place. In both Katrina and Sandy, most citizens failed to heed the order to evacuate the areas, greatly compounding the recovery process due to so many people being homeless or injured who should have left in the first place. Consideration must be given for areas with high density populations of elderly and disabled citizens, their evacuation will take substantially more effort and assistance from local, state, and federal agencies but they are also the ones most at risk to be killed or injured.
- The costs for natural disaster responses within the CONUS continue to rise. Weather predictions for the future foretell of increased hurricanes and destructive weather phenomena. The federal government cannot afford to continue to pay for the vast majority of responses like those for Katrina and Sandy. We recommend a federal commission be created to investigate ways to fairly cost share the burden of disaster response, particularly in areas that are very likely to be damaged repeatedly in years to come. This commission also needs to consider whether some areas should simply be excluded from consideration for post disaster rebuilding due to the incredibly high risk that comes with building and living in some coastal areas of the east coast, along some river deltas, and other areas such as those.

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